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MISSOURI RIVER MANAGEMENT PLAN

Holter Dam to Great Falls

1990 to 1994

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Developed by:

Montana Department of Fish, Wildlife & Parks

May 1990

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MISSOURI RIVER MANAGEMENT PLAN

Holter Dam to Great Falls

Developed by:

The Montana Department of Fish, Wildlife, and Parks

1990 through 1994

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EXECUTIVE SUMMARY

The 89-mile stretch of the Missouri River from Holter Dam to Great Falls in northcentral Montana represents one of the longest free-flowing reaches left on the entire river. Abundant rainbow trout, trophy brown trout, and excellent public access have gained the reach from Holter Dam to Cascade "blue ribbon trout stream" status. The Missouri's fishery depends on natural reproduction and provides a variety of fishing opportunities. Rainbow trout spawning surveys indicate Little Prickly Pear and Sheep creeks and the Dearborn River provide spawning habitat. The operation of three upstream dams, Canyon Ferry, Hauser and Holter, can have a significant effect on the river's fishery, wildlife, and recreational resources. There is substantial public access on the river between Holter Dam and Cascade. Fishing pressure on the Missouri from Holter Dam to Cascade increased from 45,000 angler days per year in 1983 to over 70,000 per year in 1985 and 1986.

In 1987, the Montana Fish and Game Commission recommended river management plans be developed on the top ten river fisheries in the state, including the Missouri from Holter Dam to Great Falls. The final plan presented here represents management actions produced after a year of public involvement, biological data analysis, and Fish and Game Commission decisions. The recommendations set forth in this plan were discussed and adopted by the Commission at their public meeting on September 15, 1989. This plan will be used to guide Department management efforts over the next five years (1990 through 1994) to insure the excellent recreational fishing experience on the Missouri will continue and meet public demand.

The management goal for the Missouri River from Holter Dam to Cascade is to maintain and enhance for public use, a blue ribbon wild trout fishery dominated by 14 to 17 inch rainbow trout with a greater opportunity to catch large trophy brown trout. From Cascade to Great Falls, the management goal is to enhance and diversify fishing opportunities.

Management actions adopted by the plan for *rainbow trout from Holter Dam to Cascade* include:

1. Maintain current regulation. Continue to evaluate rainbow trout populations and harvest.

2. Allow only catch and release fishing for trout in the Dearborn River from December 1 to third Saturday in May with no gear restriction.

3. Attempt to enhance minimum flows in major spawning tributaries used for irrigation through leasing of available water rights and encouraging more efficient water use.

4. Remove beaver dams and/or modify irrigation diversion structures that create major barriers to spawning movements.

Management actions adopted for *brown trout from Holter Dam to Cascade* include:

1. Change the trout limit on the Missouri River from Holter Dam to Cascade (35 river miles) to include only one brown trout which must exceed 22 inches.

2. No restrictions on use of bait.

3. Establish an early closure on the lower 12 miles of Little Prickly Pear Creek following Labor Day to protect migratory brown trout spawners.

4. Attempt to lease water in Little Prickly Pear Creek to enhance minimum spawning and rearing flows.

5. Modify or remove barriers to spawning migration in Little Prickly Pear Creek during fall.

6. Encourage main stem flows of at least 4,100 cfs.

Management actions adopted for *fisheries populations from Cascade to Great Falls* include:

1. Evaluate the potential for enhancing warm/cool water species including smallmouth bass and walleye in the reach between Cascade and Great Falls.

2. Enhance trout spawning opportunities in Sheep Creek and investigate the potential for creating or enhancing other trout spawning areas that would benefit the lower river. Carefully evaluate the possible use of hatchery rainbow trout to enhance trout fishing opportunities in the lower river.

Management actions for improving *fisheries habitat* include:

1. Support and provide input into the establishment of more stringent riverside development standards by counties and/or conservation districts.

2. Support the establishment of conservation easements on undeveloped riverside lands with emphasis on key spawning areas and on the main stem from Holter Dam to the Dearborn River and from Sheep Creek to Great Falls. Investigate available funding sources.

3. Develop cooperative riverbank restoration projects with landowners and conservation organizations and help promote the benefits of riverbank protection.

Management actions addressing the *recreational experience* on the Missouri include:

1. Use brochures, signs, or media messages to promote proper "river etiquette".

2. No action on outfitter use.

3. Maintain current management with no restrictions on motorized use.

4. Acquire new fishing access sites where determined appropriate by the MDFWP.

5. Maintain current enforcement level but investigate the possibility of creating a "river ranger" position to assist in enforcement and reduce conflicts among users. Also request assignment of more enforcement personnel to the river during the summer high-use season.

INTRODUCTION

The Missouri River is the nation's longest river, traveling 2,475 miles from Three Forks, Montana, to its confluence with the Mississippi River at St. Louis, Missouri. The 89-mile stretch from Holter Dam to Great Falls in northcentral Montana represents one of the longest free-flowing reaches on the entire river. Abundant rainbow trout, trophy browns, and excellent public access have gained the reach from Holter Dam to Cascade a "blue ribbon trout stream status". Recent estimates place the 35 mile reach's net economic fishing value at $3.6 million. In recent years, angler use on the "blue ribbon" fishery from Holter Dam to Cascade has nearly doubled.

In 1987, the Department of Fish, Wildlife, and Parks (MDFWP) proposed a fishing regulation change on the 6-mile reach of the Missouri from Wolf Creek bridge to Craig bridge. This regulation was based on recent fish and angler use information. The proposed regulation would have lowered the brown trout limit and eliminated use of bait. The Fish and Game Commission did not adopt the regulation because of conflicts between user groups. Instead, the Commission recommended river management plans be developed on the top ten river fisheries in the state, including the Missouri from Holter Dam to Great Falls. The emphasis of the plans was placed on public involvement.

The final plan presented here represents management actions produced after a year of public involvement, biological data analysis, and Fish and Game Commission decisions. In November 1988, public scoping meetings were held in Great Falls, Helena, and Bozeman to discuss river and fishery management concerns and desires. Written comments were accepted through December. Public comment and fisheries data were thoroughly analyzed and a draft report describing management alternatives was finished in June 1989 (Appendix A). Because of the length and complexity of the management alternatives report, the alternatives were condensed into an 11-page questionnaire for broad public distribution and review (Appendix B).

Prior to distribution, an advisory committee reviewed the draft management plan and questionnaire. Members of the committee represented Lewis and Clark County, Cascade County, Helena Trout Unlimited, Great Falls Walleyes Unlimited, Missouri River Flyfishers, local bait fishing advocates, riverside landowners, Montana Power Company, the US Bureau of Reclamation, and Great Falls and Helena area outfitters. The management alternatives and questionnaire were revised substantially following Advisory Committee review and discussion.

Questionnaires were sent in late July to 1,260 individuals representing three sporting clubs, river anglers contacted during creel surveys, and public meeting attenders. A statewide press release was issued on radio and newspapers to publicize the availability of the questionnaire for public comment. Questionnaire responses were tabulated and preferred management options were selected (Appendix C). Open house meetings were held in Helena and Great Falls following the selection of recommended management alternatives. These meetings provided a public forum to discuss survey results and management recommendations prior to the September meeting of the Montana Fish and Game Commission. The recommendations set forth in this plan were discussed and adopted by the Commission at their public meeting on September 15, 1989.

This plan will be used to guide Department management efforts over the next five years (1990 through 1994) to insure the excellent recreational fishing experience on the Missouri will continue and meet public demand. The Department will propose altering the management plan within the 5-year period only if changes in public desires or the fishery warrant such action. Any interim changes would receive thorough public review.

SCOPING MEETING RESULTS

A total of 183 public comments were received concerning the future management, protection, and regulation of the fishery and recreation resource of the river. Twenty-five general comments centered around maintaining, improving, or enhancing a high quality and quantity fishery with wild trout stocks. Concern was voiced that fishery potential should dictate management and the fishery should be preserved but not at the expense of the local community. The 48 comments relating to fishing regulations included concerns over limits and/or size of trout kept; establishment of a special regulation or gear restriction section; and discrimination against an angling group, i.e. anglers who use bait. Other regulation concerns centered around outfitters and guides use of the river.

Commentors generally agreed that Missouri River spawners need protection. Seasonal fishing closures on spawning tributaries and the main stem near tributary mouths were recommended. Habitat protection and enhancement were also mentioned.

Other public concerns centered around enforcement of current regulations, boat use, horsepower restrictions, and fishing access sites and their development. Introducing warm water species in the river below Ulm to diversify the fishery was mentioned. Concern was voiced for the protection and maintenance of riverside vegetation and water quality through

voiced for the protection and maintenance of riverside vegetation and water quality through various means including better communication between county government and state and federal agencies, increased monitoring of subdivision activities, education, and acquisition of conservation easements. There was a general concern for maintaining flows in the river to preserve the habitat in the main stem and the side channels. Comments suggested educating the public on boating and bank fishing etiquette. The public generally supported the continuation of fish population studies and angler use surveys to monitor and maintain the fishery.

PHYSICAL DESCRIPTION

The Missouri River flows 89 miles in a northeasterly direction from Holter Dam to Great Falls, Montana (Figure 1). The surrounding area includes the Big Belt Mountains to the southeast and the east front of the Rocky Mountains to the northwest. Tributaries entering the river in this reach are the Dearborn, Smith and Sun rivers and Little Prickly Pear, Rock, Stickney, Sheep, Prewett, Hardy, and Wegner creeks. Small communities along the river include Craig, Hardy, Cascade, and Ulm.

The river channel upstream of the Dearborn River has extensive side channel development. It becomes confined in a single, deeper channel as it flows through a mountain canyon to Sheep Creek. The river then meanders across a wide and generally flat prairie zone into Great Falls. Streamside vegetation consisting of a willow/cottonwood overstory line the lower river. This vegetation provides excellent habitat for many wildlife species including deer and pheasant and seasonal use by waterfowl, white pelican, and cormorant. Bald eagles winter along the river corridor.

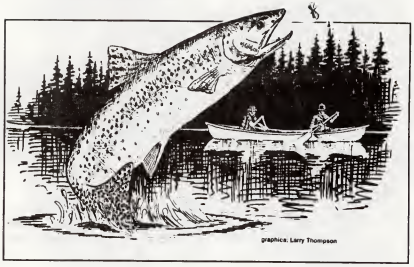
Figure 1. Map of the Missouri River from Holter Dam to Great Falls.

River corridor development through the canyon consists of several subdivisions and numerous summer residences and mobile homes. A conservation easement was recently negotiated by the Montana Land Reliance (a non-profit private organization) on 400 acres of a cattle ranch. Included in the easement was 2.5 miles of the river's west bank near Craig. Below Cascade, hay and cattle production dominate land use activities in the river corridor. Several small subdivisions are located below Cascade and above Great Falls. No special regulations are currently in effect for subdivision or other land development within the river corridor. Montana Power Company (MPC) recently sold 8,500 acres of their land along the lower river including approximately 20 miles of river corridor. This has resulted in accelerated residential development and subdivision between Cascade and Great Falls. Use of main stem water for irrigation is limited to several small diversions. The only major diversion serves the Chestnut Valley above Cascade.

Seasonal river flow patterns are largely controlled by Canyon Ferry Dam. Canyon Ferry is the largest of three consecutive upstream reservoirs and is operated by the Bureau of Reclamation. Hauser and Holter dams are owned by MPC and located downstream from Canyon Ferry. These dams are operated as "run-of- the river" projects resulting in little variation in reservoir levels.

The operation of the dams can have a significant effect on the fishery, wildlife, and recreational resources in the river downstream from Holter. Prior to the early 1970s, large daily flow fluctuations of the river resulted from the operation of Holter Dam as a power peaking facility. MPC subsequently converted to a baseload operation which created stable daily flows that benefited trout populations, anglers, and floaters. MPC considered returning Holter to a peak power facility in 1983. The Missouri River Advisory Committee was established at that time to address the peaking issue with members representing MDFWP, MPC, Bureau of Reclamation, irrigators, and sporting clubs. The committee now meets semi-annually to coordinate reservoir operations.

THE FISHERY



The Missouri River from Holter Dam to Great Falls is part of the MDFWP's Central Fishing District. The river is open the entire year to angling and commercial whitefish fishing. Current fishing regulations include a limit of 5 trout per day with one over 18 inches.

Like all Montana rivers, the Missouri's fishery depends on natural reproduction. Prior to 1973, 20,000 to 50,000 3 to 7-inch rainbow trout were planted annually in the river above Cascade. Today, no fish are stocked in the river although hatchery rainbows planted in Holter Reservoir flush into the river during years with high runoff. The river sustains an annual harvest of around 40,000 rainbow trout, 3,000 brown trout, and 6,000 whitefish based totally on natural reproduction now.

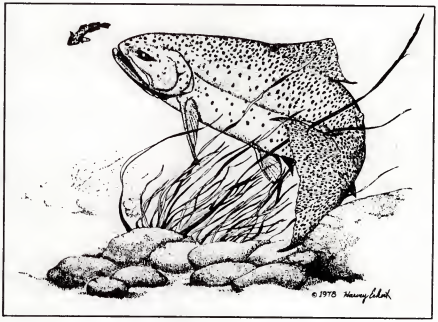
MDFWP fisheries management activities on the river now include monitoring sport fish populations, angler harvest, river flows, and spawning runs. Two long-term study sections are electrofished in the spring and fall to estimate trout population numbers. Creel census surveys are conducted when necessary depending on availability of funds and manpower. Data are used to determine brown and rainbow trout population response to changing environmental conditions and angler use patterns. Rainbow trout planted in Holter Reservoir are marked annually to determine the effects of hatchery fish flushed from the reservoir on the river population. Monitoring of spawning tributaries includes identifying critical habitat, estimating run size, monitoring land management activities, and enhancing upstream movement of adults and downstream movement of fry.

Fisheries habitat is also monitored and protected. Development projects altering streambeds or banks are reviewed using the Natural Streambed and Land Preservation Act of 1975 and the Stream Preservation Act. Water discharge permit applications and renewals are tracked. Pollution complaints and fish kills are also investigated.

Protection of instream flows in the river has occurred by several avenues. In 1969, The Fish and Game Commission filed for water rights on the unappropriated waters of 12 streams to maintain instream flows for fish and wildlife. The Missouri from Holter Dam down to Cascade was one of the 12 streams filed under the "Murphy Rights" (named after the principal sponsor of the bill that provided the filing authority). The MDFWP is now filing for an instream water reservation on the river to Great Falls. This instream request

will help protect the river's blue ribbon fishery and maintain flows to sustain fish populations in the Wild and Scenic segment from Ft. Benton down to the Fred Robinson Bridge. Operation guidelines established by the Missouri River Advisory Committee include spill restrictions and drawdown schedules for the reservoirs. A target daily release of 4,100 cfs from Holter Dam has also been recommended by the Committee. The ability to provide these flows is affected by runoff and precipitation, electrical demand, and the need to manipulate reservoir levels for flood control and recreation.

FISH POPULATIONS



The Missouri River from Holter Dam to Great Falls provides a variety of fishing opportunities. Twenty species of fish are found. The most common are rainbow trout, brown trout, mountain whitefish, longnose dace, longnose sucker, white sucker, mottled sculpin, burbot, walleye, and carp.

Trout utilize habitat in the river created by rooted aquatic vegetation, deep water, large rocks, overhanging shoreline brush, and roughness of the water's surface. The high quality trout fishery is due in part to nutrient-rich water that helps produce abundant populations of aquatic insects, zooplankton, and forage fish. Water temperatures from Holter Dam to Ulm appear optimal for trout survival.

The reach from Holter Dam to Cascade is rating as a "blue ribbon trout stream" or a Class I Sport Fishery by the MDFWP. At 3,500 pounds of trout per mile, this reach ranks at the top with the Bighorn and Beaverhead for trout production. Mountain whitefish, walleye, and burbot are considered secondary sport fish.

Trout populations from the dam to the Dearborn River are represented by fisheries data collected from the Craig long-term fisheries study section (Wolf Creek Bridge to Craig Bridge, 5.6 miles in length). Catchable rainbow trout (10 inches and longer) averaged 1,700 to 2,600 fish per mile from 1982-1988 and average weight and length have remained consistent. Rainbow trout averaged just more than a pound and ranged up to 4 pounds. Catchable brown trout numbers were much lower, estimated at 160-270 trout per mile. Average length and weight have remained stable. Brown trout averaged about 2 pounds and have been recorded as high as 17 pounds.

Fisheries data collected in the Cascade long-term fisheries study section are considered generally representative of trout populations in the river from Sheep Creek to the Cascade Bridge. Catchable trout numbers are lower here averaging 900 to 1,500 rainbow and 250 brown trout per mile. Rainbows outnumber brown trout by a 5 or 10 to 1 ratio in both sections.

A major factor affecting rainbow trout numbers was identified during recent data analysis. The number of young fish entering the population has varied annually, ranging from 540 to over 2,000 fish per mile in the Craig section (Table 1). In most rivers, high numbers of young fish usually mean more larger fish a few years later. This does not appear to be true in the Missouri. By the time rainbows reach 3 years old (15 inches average length in the fall), their numbers consistently average 790 per mile, regardless of the original number of young fish. This "bottleneck" currently cannot be explained.

Table 1. Fall population estimates (numbers per mile) for rainbow trout in the Missouri River–Craigsection from 1982 to 1987.

	Year						
	1982	1983	1984	1985	1986	1987	Ave.
Age							
1	540	1,434	2,372	1,217	2,055	962	1,438
2	777	629	1,299	1,077	861	1,418	1,101
3	736	799	880	803	739	776	789
4	158	257	665	350	460	213	351
5	27	8	67	47	11	38	33
Tot	2,238	3,127	5,283	3,494	4,127	3,406	3,613

There is no pattern in the fluctuations of brown trout numbers annually. The brown trout population levels remain relatively constant from Holter Dam to Cascade. The numbers in the Craig study section increase each fall when mature fish concentrate during spawning. Growth is considerably better for brown trout compared to rainbow trout (Table 2). The average length of a 4 year old brown trout in the fall was nearly 20 inches compared to 17 inches for rainbow trout.

Brown trout comprise about two-thirds of the trophy (18 inches and longer) trout fishery in the Missouri. Trophy brown trout have been estimated up to 170 per mile, averaging 3 pounds and contributing 10 to 15% of the brown trout catch in recent years.

The 26-mile river stretch from Cascade to the Smith River meanders through flat prairie and ranch country. Rainbow and brown trout and mountain whitefish continue to dominate the sport fishery but overall numbers are much lower than in the upper river. Other game species include burbot (ling) and walleye. Other fish species include longnose and white sucker, mottled sculpin, stonecat, and carp. This reach is a Class II sport fishery.

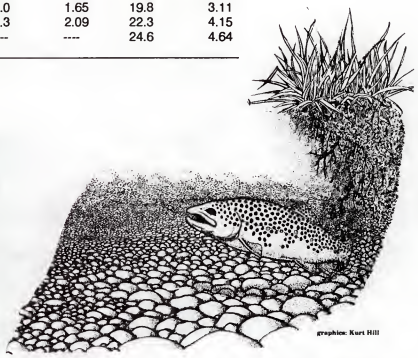
Lower trout biomass, aesthetics, and recreational use lead to this lower rating.

Below the Smith River, the Missouri continues in a wide, low gradient channel for 29 miles before reaching Great Falls. Little is known of the limited fishery in this reach and it is considered a transitional zone between the cold-water fishery above Ulm and the warm-water fishery below Great Falls. Rainbow and brown trout numbers are limited and mountain whitefish are common. Walleye and burbot also contribute to the fishery. Tributary spawning habitat for trout is limited and no developed access is currently available. Low trout abundance, limited access, and lower aesthetics and recreational use lead to the three reaches in this section receiving a Class III or Class IV sport fishery value.

Table 2. Average size of rainbow and brown trout during the fall in the Missouri River–Craigsection for 1982–1988.

Age (Years)	Size at Age			
	Rainbow Trout		Brown Trout	
	Inches	Pounds	Inches	Pounds
1	9.1	0.35	10.4	.49
2	12.7	.90	14.2	1.17
3	15.3	1.32	17.0	2.00
4	17.0	1.65	19.8	3.11
5	18.3	2.09	22.3	4.15
6	----	----	24.6	4.64

SPAWNING


graphics: Kurt Hill

Rainbow trout spawning surveys indicate Little Prickly Pear Creek and the Dearborn River provide about 80% of the spawning habitat for the Missouri River population. In 1988, roughly 15,000 and 20,000 spawners used Little Prickly Pear and the Dearborn, respectively. Approximately 4,000 rainbow trout used the lower 4 miles of Sheep Creek and its South Fork in 1987. The importance of the Smith River as a spawning tributary is unknown but considered to be limited. Stickney, Wegner, Rock, and Hardy creeks, tributaries between Craig and Ulm, are known to support limited runs in some years but suffer from low natural flows. Available spawning for trout below Cascade appears to be limited to Sheep Creek. Tag returns identify Sheep Creek

as spawning habitat for rainbow trout living in the river all the way to Great Falls.

Fish trapping and electrofishing in the fall, 1988 indicated extensive use of Little Prickly Pear Creek by Missouri River brown trout. Although no estimate of total numbers was obtained, the results suggest a substantial brown trout run. Sheep Creek receives some use by brown trout spawners but suffers from low natural winter flows. No brown trout spawning activity was observed in the Dearborn River during a survey in the fall, 1988.

Several problems currently face the major spawning tributaries for Missouri River trout. On Little Prickly Pear Creek, irrigation practices, blockage by beaver dams, and land use activities reduce spawning success. Sheep Creek has an irrigation diversion near the mouth and a substantial timber sale currently occurring on private land within its North Fork. Numerous beaver dams hamper spawning migration in many years. Water temperature data indicate a suitable range for trout survival in Sheep and Little Prickly Pear creeks but maximum summer temperatures in the Dearborn River appear to be marginal. Severe dewatering and irrigation return flows contribute to this warming. Other problems in the Dearborn include land use practices and use of the stream bed for vehicular travel in low water periods.

ANGLER USE

Fishing pressure on the Missouri from Holter Dam to Cascade increased from 45,000 angler days per year in 1983 to over 70,000 per year in 1985 and 1986. The fishing pressure in 1985 and 1986 was higher than all other Montana rivers except the Madison. The majority of anglers were Montana residents and most were from Cascade (Great Falls area) or Lewis and Clark counties. About 10 to 20% of the anglers were from other Montana counties. Non-resident use increased from 8-11% of the anglers in the early 1980s to 14% in 1987. Non-resident use on other "blue ribbon" trout rivers east of the Continental Divide ranges from 23% to 91% with an average of about 45%. Fishing pressure from Cascade to Great Falls was estimated at 14,400 days per year in 1983, 1985, and 1986.

Angler use on various river sections appears to be affected by residency and preferred angling method. More Cascade County residents fish immediately below Holter Dam and near Ulm using bait. Lewis and Clark County residents and non-residents are the primary users downstream from the Wolf Creek bridge to Cascade using flies and artificial lures. Fishing is mainly from boats in this reach. Guided trips have been most numerous from Wolf Creek bridge to Craig bridge, where they represented 19% of the total boat anglers in 1986. Most guided anglers are non-residents.

Recent catch rate information from the Craig and Cascade sections indicate an average of .45 rainbow trout were caught per hour and .06 brown trout, combined to total .51 trout per hour. Catch rates for total trout on other "blue ribbon" streams east of the divide ranged from .46 to .95. Catch rates for rainbow trout decrease progressively in a downstream direction, dropping to 0.14 trout/hour from Cascade to Ulm. Brown trout catch rates drop to .01 per hour in this section.

Harvest data collected in 1981 show anglers kept 42% of the rainbows caught and 17% of the brown trout. These percentages varied by river section. Almost all the rainbow and brown trout harvested were greater than 10 inches and over half were greater than 13 inches. Average length for harvested rainbow trout was 14.2 inches and 15 inches for brown trout.

Fishing from boats produced higher catch rates than fishing from the shore. Harvest rates for the two groups were identical indicating that boat anglers released a greater percentage of their catch. Fly fisherman had the highest catch rates and the lowest harvest rates, releasing about 90% of the trout caught. Lure and bait anglers experienced lower catch rates but harvested a much greater percentage of the catch.

Over the past six years, the use of artificial baits has doubled and catch rates for rainbow and brown trout have also increased on the Missouri. The number of rainbows kept per hour has decreased by 50% even though catch rates have increased. Numbers of brown trout kept per hour remains unchanged.

The 1987 creel census collected data on hatchery fish spilling from Holter Reservoir. Seventeen percent of the fish caught by river anglers immediately below the dam were hatchery trout originally planted in the reservoir. All of these fish were caught within 0.5 miles of Holter Dam and were caught only through June. In this low flow year, spilled hatchery trout concentrated immediately below the dam. They were harvested heavily by anglers and apparently did not survive long in the river environment. Higher flows might extend hatchery fish distribution downstream and later into the season.

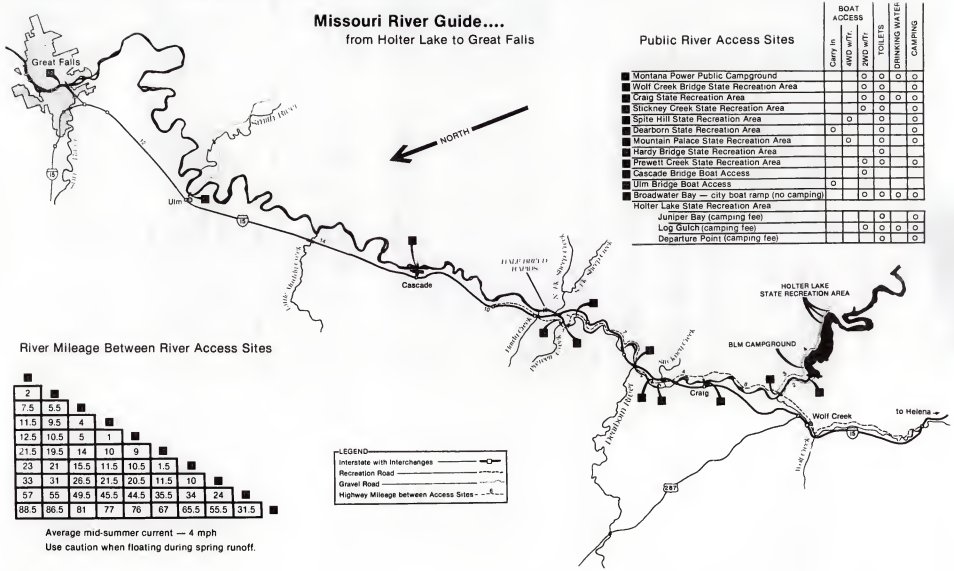
ACCESS

There is substantial public access on the river between Holter Dam and Cascade. (Figure 2.) There are eight state recreation areas with boat access, one public campground owned by Montana Power, and a boat access at Cascade bridge. Most are developed with toilets and boat ramps and some have campgrounds. Average distance between these sites is 4 miles. A frontage road (old US Highway 91) has been designated as a recreation road and parallels the river from the Wolf Creek bridge to Great Falls.

Public access below the Cascade Bridge has been limited to an undeveloped county road access at Ulm and a city owned boat ramp in Great Falls. Transactions have recently been completed to acquire three state access sites. The first is located four river miles upstream from Ulm bridge. The second lies between Ulm bridge and the mouth of the Smith River and the last site is located 10 miles upstream from Great Falls.

Missouri River Guide....

from Holter Lake to Great Falls



Public River Access Sites

	BOAT ACCESS: Carry In	BOAT ACCESS: 4WD w/Tr.	BOAT ACCESS: 2WD w/Tr.	TOILETS	DRINKING WATER	CAMPING
Montana Power Public Campground			O	O	O	O
Wolf Creek Bridge State Recreation Area			O	O		O
Craig State Recreation Area			O	O	O	O
Stickney Creek State Recreation Area			O	O		O
Spite Hill State Recreation Area		O		O		O
Dearborn State Recreation Area	O			O		O
Mountain Palace State Recreation Area		O		O		O
Hardy Bridge State Recreation Area				O		
Prewett Creek State Recreation Area			O	O		O
Cascade Bridge Boat Access			O			
Ulm Bridge Boat Access	O					
Broadwater Bay — city boat ramp (no camping)			O	O	O	O
Holter Lake State Recreation Area						
Juniper Bay (camping fee)				O		O
Log Gulch (camping fee)			O	O	O	O
Departure Point (camping fee)				O		O

River Mileage Between River Access Sites

2								
7.5	5.5							
11.5	9.5	4						
12.5	10.5	5	1					
21.5	19.5	14	10	9				
23	21	15.5	11.5	10.5	1.5			
33	31	26.5	21.5	20.5	11.5	10		
57	55	49.5	45.5	44.5	35.5	34	24	
88.5	86.5	81	77	76	67	65.5	55.5	31.5

Average mid-summer current — 4 mph

Use caution when floating during spring runoff.

MANAGEMENT GOAL

From Holter Dam to Cascade, maintain and enhance for public use, a blue ribbon wild trout fishery dominated by 14 to 17 inch rainbow trout with a greater opportunity to catch large trophy brown trout. From Cascade to Great Falls, to enhance and diversify fishing opportunities.

MANAGEMENT ACTIONS

FISH POPULATIONS- HOLTER DAM TO CASCADE

Rainbow Trout

1. *Maintain current regulation. Continue to evaluate rainbow trout populations and harvest. If necessary, propose new fishing regulations in 1991.*

   The public strongly supported maintaining current regulations as well as establishing a short experimental "catch and release" section. The actions preferred by the public were equally split between these two alternatives. Current angler harvest on Missouri rainbows is not considered high compared to other Montana "blue ribbon" rivers. Most fish over 17 inches appear to die from natural causes rather than angler harvest. Natural factors appear to limit the number of rainbows from 14 to 17 inches when production of young fish from spawning areas is adequate, as it has been in normal flow years. The potential to increase rainbow numbers and/or size in normal flow years using more restrictive fishing regulations appears limited because of these factors.

   Because of biological data and public support, current regulations will be maintained. This will allow time to thoroughly evaluate creel and fish population data and prevent proposing a regulation that may not be effective or necessary.

2. *Allow only catch and release fishing for trout in the Dearborn River from December 1 to third Saturday in May with no gear restriction.*

   Most of Missouri rainbow trout spawn in three tributaries to the river, the Dearborn River and Little Prickly Pear and Sheep creeks. Irrigation practices, beaver dams, and dewatering currently reduce spawning success in these streams. Improving spawning success should lead to increased numbers of smaller rainbows (10 to 14 inches) in the Missouri River and stabilize numbers of young fish entering the river population each year.

   More questionnaire respondents (31% combined) favored some action to protect Missouri River rainbows spawning in the Dearborn River than any other proposed alternative. Because the Dearborn is relatively inaccessible and has a very short

float season (often only May and June), a complete closure may overly restrict and severely reduce fishing opportunities. Catch and release should protect spawners well into the future while still allowing some recreational fishing to occur. Regulations could be tightened if problems develop in the future.

3. *Attempt to enhance minimum flows in major spawning tributaries used for irrigation through leasing of available water rights and encouraging more efficient water use.*

A bill passed during the 1989 Legislature gave MDFWP the opportunity to study the potential for leasing water rights to enhance minimum instream flows. A report will be presented to the Legislature in 1991. It may be found that leasing water is expensive and will involve complex negotiations and stream flow monitoring. It also may require further changes in state water law for permanent flow enhancement.

4. *Remove beaver dams and/or modify irrigation diversion structures that create major barriers to spawning movements.*

Beaver dams are an annual problem for spawning access in Sheep and Little Prickly Pear creeks. Removal of beaver dams is relatively inexpensive and it could significantly increase spawning habitat availability.

Brown Trout

1. *Change the trout limit on the Missouri River from Holter Dam to Cascade (35 river miles) to include only one brown trout which must exceed 22 inches.*

Sixty percent of the questionnaire respondents favored some change in the current brown trout regulation compared to 16 percent who wanted the current regulation maintained. However, there was no consensus on which regulation alternative they preferred. Currently, rainbow trout are 5 to 10 times more numerous than brown trout but brown trout comprise about two-thirds of the trophy trout fishery. Because of low numbers and an annual harvest of up to 60 to 70 percent on all brown trout, protecting younger as well as older brown trout is necessary for a fishing regulation to have a significant effect. A "slot limit" (such as one brown less than 11" and one over 22") might cause overharvest of young brown trout because of existing high fishing pressure and a sparse brown trout population. A one fish limit with a 22 inch minimum size was selected because it had a greater probability for success and received public acceptance. The minimum size also maintains consistency with other special regulations currently in place on portions of the Smith, Big Hole, and Yellowstone rivers.

The regulation change could substantially increase brown trout numbers, particularly larger trout. The regulation will also allow most fish to spawn at least once prior to reaching legal size. The regulation should not affect many users because only 10 percent of anglers currently keep a brown trout.

Questionnaire respondents favored extending the special brown trout limit over the entire river from Holter Dam to Cascade by a 2 to 1 margin. This will allow the entire brown trout population to benefit from the more restrictive regulation.

2. *No restrictions on use of bait.*

A summary of most published hooking mortality studies concludes that trout caught and released using bait suffer 25 percent mortality compared to 6 percent for lures and 4 percent for flies. The number of anglers that fish with bait on the Missouri, however, is relatively low and they typically catch significantly fewer trout than those who use artificials. Allowing bait fishing to continue will maintain fishing opportunities to the entire public. The net loss of trout from catch and release bait fishing will probably not be high enough to jeopardize the effectiveness of the brown trout special regulation.

3. *Establish an early closure on the lower 12 miles of Little Prickly Pear Creek following Labor Day to protect migratory brown trout spawners.*

Little Prickly Pear Creek is the only known tributary receiving heavy spawning use by the river's brown trout population. Because the creek is small and accessible and the fish are very large and limited in number, angling pressure in the fall can be detrimental to the reproducing population. Closing the lower 12 miles of Little Prickly Pear Creek to fishing following Labor Day will allow more brown trout to spawn, maximizing production of young fish and increasing overall brown trout numbers including larger trout.

4. *Attempt to lease water in Little Prickly Pear Creek to enhance minimum spawning and rearing flows.*

A bill passed during the 1989 Legislative gave MDFWP the opportunity to study the potential for leasing water rights to enhance minimum instream flows. A report will be presented to the Legislature in 1991. Leasing water would prevent dewatering of Little Prickly Pear Creek but it may prove to be too expensive to be feasible. Leasing will involve complex negotiations and stream flow monitoring and may require further changes in state water law to provide permanent flow enhancement.

5. *Modify or remove barriers to spawning migration in Little Prickly Pear Creek during fall.*

Removing beaver dams is relatively inexpensive and should increase spawning habitat availability.

6. *Encourage main stem flows of at least 4,100 cfs.*

Minimum flows at 4,100 cfs will maintain important side channel spawning and rearing areas. Adequate flows in the river to maintain trout spawning and rearing areas are essential for sustaining the wild trout population in the Missouri. These flows may not be possible in low water years and could impact power production and

recreational opportunities at Canyon Ferry by causing drawdowns. Minimum flow recommendations can be modified if better information becomes available in the future.

FISH POPULATIONS-CASCADE TO GREAT FALLS

1. *Evaluate the potential for enhancing warm/cool water species including smallmouth bass and walleye in the reach between Cascade and Great Falls.*

   Diversifying the fishery below Cascade will be evaluated in order to expand fishing opportunities in the lower river. Concerns over this type of enhancement include the potential negative impact on the upper river's trout population and the availability of hatchery fish.

2. *Enhance trout spawning opportunities in Sheep Creek and investigate the potential for creating or enhancing other trout spawning areas that would benefit the lower river. Carefully evaluate the possible use of hatchery rainbow trout to enhance trout fishing opportunities in the lower river.*

FISH HABITAT

1. *Support and provide input into the establishment of more stringent riverside development standards by counties and/or conservation districts.*

   The vegetation along a river's banks (riparian zone) provides some of the most productive wildlife habitat, contributes to fish cover and shade, helps stabilize banks from erosion, and enhances the aesthetic quality of the river. Maintaining the health of riparian vegetation is critical to sustaining the corridor's natural resource values. The majority of the Missouri River corridor is privately owned and changes in land use and ownership will continue to occur in the future. Lewis and Clark and Cascade counties are responsible for subdivision and land development regulation within the corridor.

   There was a strong sentiment among questionnaire respondents that the Missouri River corridor is in a degraded state, that current laws and regulations are not adequate, and that more stringent land developments standards would be supported. Although the majority of respondents who owned land along the river felt the corridor wasn't in a degraded state, they were also supportive of more stringent development standards.

2. *Support the establishment of conservation easements on undeveloped riverside lands with emphasis on key spawning areas and on the main stem from Holter Dam to the Dearborn River and from Sheep Creek to Great Falls. Investigate available funding sources.*

Conservation easements would prevent potentially damaging streamside activities in key spawning and rearing areas while preserving current land uses and ownership.

3. *Develop cooperative riverbank restoration projects with landowners and conservation organizations and help promote the benefits of riverbank protection by:*

* *Promoting the benefits of good riparian management to river bank land owners.*

* *Cooperating with sporting clubs and landowners to develop projects for revegetating rip rap and repairing damaged and unstable streambanks.*

* *Developing standards with conservation districts for river bank alterations by home owners.*

Involving landowners and river users in protecting streamside vegetation will promote the critical role of riparian areas to users and landowners alike. These actions involve no new regulations and encourage voluntary participation.

QUALITY OF THE RECREATIONAL EXPERIENCE

User Conflicts

1. *Use brochures, signs, or media messages to promote proper "river etiquette".*

Comments made at public meetings and on the questionnaires suggest most people favor promoting proper "river etiquette" (common courtesy between and among shore and boat anglers) rather than regulating floating. In 1986, shore and boat fishing pressure were nearly equal in the Craig section.

2. *No action on outfitter use.*

"Too many outfitters" was the third most commonly mentioned problem from questionnaire respondents. Many felt that outfitter use has increased dramatically in the past two years. Due in part to low water conditions in other "Blue Ribbon" rivers in Montana, it probably has. The national media has also discovered the excellent quality fly fishing to be found on the Missouri.
Sixty-seven percent of respondents felt that outfitter use should be controlled. The Department's role in controlling outfitter use on rivers may need to be examined on a statewide basis. The outfitting industry is now regulated by the Department of Commerce. No action is proposed until MDFWP's role is clarified.

Motor Boat Use

1. *Maintain current management with no restrictions on motorized use.*

"Too many motorboats" was the most commonly mentioned problem on the Missouri by questionnaire respondents. However, a substantial number of respondents (35%) favored no restrictions on use of boat motors. Most of those who favored restrictions supported either a 10 horsepower limit or total elimination of motors. There was little support for more moderate alternatives such as allowing motorized travel only in a downstream direction with no wake or restricting motorized use in certain section(s) only during high use season. Under current regulations, the Fish and Game Commission can only restrict motorboat use or public waters in the interest of public health, public safety, and protection of property (ARM 87-1-303).

At this time no changes in rules governing motorized boat use on the Missouri River will be made. The situation will be studied over the next five years to determine if restrictions are needed and can be justified.

Fishing Access

1. *Acquire new fishing access sites where determined appropriate by the MDFWP.*

Most respondents (70%) felt the MDFWP should acquire new access sites where needed. The river reaches most commonly identified on the questionnaire as needing additional access were: (1) Cascade to Ulm (22 river miles), and (2) Ulm to Great Falls (28 river miles). Acquiring additional river access sites could disperse recreational use, shorten float times, and more effectively utilize the fishery resource. However, purchasing new sites creates new development, maintenance, and acquisition costs; may reduce the level of solitude in remote river sections; and could lead to overharvest of fish populations.

Future department efforts will focus on developing recently acquired sites near Ulm and between Ulm and Great Falls. Potential new sites between Cascade and Ulm will be investigated before any additional sites between Ulm and Great Falls are acquired.

Respondents strongly felt that development and maintenance at existing sites was adequate. Boat ramps, outhouses, and parking areas were the most commonly preferred facilities for new access sites.

Enforcement

1. *Maintain current enforcement level but investigate the possibility of creating a "river ranger" position to assist in enforcement and reduce conflicts among users. Also request assignment of more enforcement personnel to the river during the summer high-use season.*

   Increasing enforcement patrols or implementing a river ranger program on the Missouri could help encourage the wise use of the fishery and recreational resource and could help the Department monitor user satisfaction. However, these measures are costly and may require diverting a warden's time from another priority area.

APPENDIX A

MISSOURI RIVER

MANAGEMENT ALTERNATIVES

MISSOURI RIVER MANAGEMENT ALTERNATIVES
Holter Dam to Great Falls

INTRODUCTION

The Missouri River is the nation's longest river, traveling 2,475 miles from Three Forks, Montana, to its confluence with the Mississippi River at St. Louis, Missouri. The 89-mile stretch from Holter Dam to Great Falls in northcentral Montana represents one of the longest free-flowing reaches on the entire river. Abundant rainbow trout, trophy browns, and excellent public access have gained the reach from Holter Dam to Cascade a "blue ribbon trout stream status". Recent estimates place the 35 mile reach's net economic fishing value at $3.6 million. In recent years, angler use on the "blue ribbon" fishery from Holter Dam to Cascade has nearly doubled.

In 1987, the Department of Fish, Wildlife, and Parks (DFWP) proposed a fishing regulation change on the 6-mile reach of the Missouri from Wolf Creek bridge to Craig bridge. This regulation was based on recent fish and angler use information. The proposed regulation would have lowered the brown trout limit and eliminated use of bait. The Fish and Game Commission did not adopt the regulation because of conflicts between user groups. Instead, the Commission recommended river management plans be developed on the top ten river fisheries in the state, including the Missouri from Holter Dam to Great Falls. The emphasis of the plans was placed on public involvement.

This document presents a series of alternatives with advantages and disadvantages for managing the fishery in the Missouri River for the next five years. It also contains a physical description of the river and its fisheries, a discussion of past and present management activities, and results of three public meetings held during November, 1988. A questionnaire addressing the major issues has also been developed to survey public opinion and help select the preferred courses of action. A final management plan will be considered for adoption by the Fish and Game Commission in the fall of 1989. Selected alternatives will be implemented to insure that the river continues to provide an excellent recreational fishing experience and satisfies public demand.

PHYSICAL DESCRIPTION

The Missouri River flows 89 miles in a northeasterly direction from Holter Dam to Great Falls, Montana (Figure 1). The surrounding area includes the Big Belt Mountains to the southeast and the east front of the Rocky Mountains to the northwest. Tributaries entering the river in this reach are the Dearborn, Smith and Sun rivers and Little Prickly Pear, Rock, Stickney, Sheep, Prewett, Hardy, and Wegner creeks. Small communities along the river include Craig, Hardy, Cascade, and Ulm.

Figure 1. Map of the Missouri River from Holter Dam to Great Falls.

The river channel upstream of the Dearborn River has extensive side channel development. It becomes confined in a single, deeper channel as it flows through a mountain canyon to Sheep Creek. The river then meanders across a wide and generally flat prairie zone into Great Falls. Streamside vegetation consisting of a willow/cottonwood overstory line the lower river. This vegetation provides excellent habitat for many wildlife species including deer and pheasant and seasonal use by waterfowl, white pelican, and cormorant. Bald eagles winter along the river corridor.

River corridor development through the canyon consists of several subdivisions and numerous summer residences and mobile homes. A conservation easement was recently negotiated by the Montana Land Reliance (a non-profit private organization) on 400 acres of a cattle ranch. Included in the easement was 2.5 miles of the river's west bank near Craig. Below Cascade, hay and cattle production dominate land use activities in the river corridor. Several small subdivisions are located below Cascade and above Great Falls. No special regulations are currently in effect for subdivision or other land development within the river corridor. Montana Power Company (MPC) recently sold 8,500 acres of their land along the lower river including approximately 20 miles of river corridor. This has resulted in accelerated residential development and subdivision between Cascade and Great Falls. Use of main stem water for irrigation is limited to several small diversions. The only major diversion serves the Chestnut Valley above Cascade.

Seasonal river flow patterns are largely controlled by Canyon Ferry Dam. Canyon Ferry is the largest of three consecutive upstream reservoirs and is operated by the Bureau of Reclamation. Hauser and Holter dams are owned by MPC and located downstream from Canyon Ferry. These dams are operated as "run-of-the river" projects resulting in little variation in reservoir levels.

The operation of the dams can have a significant effect on the fishery, wildlife, and recreational resources in the river downstream from Holter. Prior to the early 1970s, large daily flow fluctuations of the river resulted from the operation of Holter Dam as a power peaking facility. MPC subsequently converted to a baseload operation which created stable daily flows that benefited trout populations, anglers, and floaters. MPC considered returning Holter to a peak power facility in 1983. The Missouri River Advisory Committee was established at that time to address the peaking issue with members representing DFWP, MPC, Bureau of Reclamation, irrigators, and sporting clubs. The committee now meets semi-annually to coordinate reservoir operations.

THE FISHERY

The Missouri River from Holter Dam to Great Falls is part of the DFWP's Central Fishing District. The river is open the entire year to angling and commercial whitefish fishing. Current fishing regulations include a limit of 5 trout per day with one over 18 inches.

Like all Montana rivers, the Missouri's fishery depends on natural reproduction. Prior to 1973, 20,000 to 50,000 3 to 7-inch rainbow trout were planted annually in the river above Cascade. Today, no fish are stocked in the river although hatchery rainbows planted in Holter Reservoir flush into the river during years with high runoff. The river sustains an annual harvest of around 40,000 rainbow trout, 3,000 brown trout, and 6,000 whitefish based totally on natural reproduction now.

DFWP fisheries management activities on the river now include monitoring sport fish populations, angler harvest, river flows, and spawning runs. Two long-term study sections are electrofished in the spring and fall to estimate trout population numbers. Creel census surveys are conducted when necessary depending on availability of funds and manpower. Data are used to determine brown and rainbow trout population response to changing environmental conditions and angler use patterns. Rainbow trout planted in Holter Reservoir are marked annually to determine the effects of hatchery fish flushed from the reservoir on the river population. Monitoring of spawning tributaries includes identifying critical habitat, estimating run size, monitoring land management activities, and enhancing upstream movement of adults and downstream movement of fry.

Fisheries habitat is also monitored and protected. Development projects altering streambeds or banks are reviewed using the Natural Streambed and Land Preservation Act of 1975 and the Stream Preservation Act. Water discharge permit applications and renewals are tracked. Pollution complaints and fish kills are also investigated.

Protection of instream flows in the river has occurred by several avenues. In 1969, The Fish and Game Commission filed for water rights on the unappropriated waters of 12 streams to maintain instream flows for fish and wildlife. The Missouri from Holter Dam down to Cascade was one of the 12 streams filed under the "Murphy Rights" (named after the principal sponsor of the bill that provided the filing authority). The DFWP is now filing for an instream water reservation on the river to Great Falls. This instream request will help protect the river's blue ribbon fishery and maintain flows to sustain fish populations in the Wild and Scenic segment from Ft. Benton down to the Fred Robinson Bridge. Operation guidelines established by the Missouri River Advisory Committee include spill restrictions and drawdown schedules for the reservoirs. A target daily release of 4,100 cfs from Holter

Dam has also been recommended by the Committee. The ability to provide these flows is affected by runoff and precipitation, electrical demand, and the need to manipulate reservoir levels for flood control and recreation.

FISH POPULATIONS

The Missouri River from Holter Dam to Great Falls provides a variety of fishing opportunities. Twenty species of fish are found. The most common are rainbow trout, brown trout, mountain whitefish, longnose dace, longnose sucker, white sucker, mottled sculpin, burbot, walleye, and carp.

Trout utilize habitat in the river created by rooted aquatic vegetation, deep water, large rocks, overhanging shoreline brush, and roughness of the water's surface. The high quality trout fishery is due in part to nutrient-rich water that helps produce abundant populations of aquatic insects, zooplankton, and forage fish. Water temperatures from Holter Dam to Ulm appear optimal for trout survival.

The reach from Holter Dam to Cascade is rating as a "blue ribbon trout stream" or a Class I Sport Fishery by the DFWP; an honor bestowed to only 34 other rivers in the state. At 3,500 pounds of trout per mile, this reach ranks at the top with the Bighorn and Beaverhead for trout production. Mountain whitefish, walleye, and burbot, are considered secondary sport fish.

Trout populations from the dam to the Dearborn River are represented by fisheries data collected from the Craig long-term fisheries study section (Wolf Creek Bridge to Craig Bridge, 5.6 miles in length). Catchable rainbow trout (10 inches and longer) averaged 1,700 to 2,600 fish per mile from 1982-1988 and average weight and length have remained consistent. Rainbows averaged just more than a pound and ranged up to 4 pounds. Catchable brown trout numbers were much lower, estimated at 160-270 trout per mile but average length and weight have remained stable. Browns averaged about 2 pounds and have been recorded as high as 17 pounds.

Fisheries data collected in the Cascade long-term fisheries study section are considered generally representative of trout populations in the river from Sheep Creek to the Cascade Bridge. Catchable trout numbers are lower here averaging 900 to 1,500 rainbow and 250 brown trout per mile. Rainbows outnumber brown trout by a 5 or 10 to 1 ratio in both sections.

A major factor affecting rainbow trout numbers was identified during recent data analysis. The number of young fish entering the population has varied annually, ranging from 540 to over 2,000 fish per mile in the Craig section (Table 1). In most

Table 1. Fall population estimates(numbers per mile) for rainbow trout in the Missouri River-Craig section from 1982 to 1987.

	Year						
	1982	1983	1984	1985	1986	1987	Ave.
Age							
1	540	1,434	2,372	1,217	2,055	962	1,438
2	777	629	1,299	1,077	861	1,418	1,101
3	736	799	880	803	739	776	789
4	158	257	665	350	460	213	351
5	27	8	67	47	11	38	33
Total	2,238	3,127	5,283	3,494	4,127	3,406	3,613

rivers, high numbers of young fish usually mean more larger fish a few years later. This does not appear to be true in the Missouri. By the time rainbows reach 3 years old (15 inches average length in the fall), their numbers consistently average 790 per mile, regardless of the original number of young fish. This "bottleneck" currently cannot be explained.

There is no pattern in the fluctuations of brown trout numbers annually. The brown trout population levels remain relatively constant from Holter Dam to Cascade. The numbers in the Craig study section increase each fall when mature fish concentrate during spawning. Growth is considerably better for brown trout compared to rainbows (Table 2). The average length of a 4 year old brown trout in the fall was nearly 20 inches compared to 17 inches for rainbows.

Brown trout comprise about two-thirds of the trophy (18 inches and longer) trout fishery in the Missouri. Trophy brown trout have been estimated up to 170 per mile, averaging 3 pounds and contributing 10 to 15% of the brown trout catch in recent years.

The 26-mile river stretch from Cascade to the Smith River meanders through flat prairie and ranch country. Rainbow and brown trout and mountain whitefish continue to dominate the sport fishery but overall numbers are much lower than in the upper river. Other game species include burbot (ling) and walleye. Other fish species include longnose and white sucker, mottled sculpin, stonecat, and carp. This reach is a Class II sport fishery. Lower trout biomass, aesthetics, and recreational use lead to this lower rating.

Below the Smith River, the Missouri continues in a wide, low gradient channel for 29 miles before reaching Great Falls. Little is known of the limited fishery in this reach and it is considered a transitional zone between the cold-water fishery above Ulm and the warm-water fishery below Great Falls. Rainbow and brown trout numbers are limited and mountain whitefish are common. Walleye and burbot also contribute to the fishery. Tributary spawning habitat for trout is limited and no developed access is currently available. Low trout abundance, limited access, and lower aesthetics and recreational use lead to the three reaches in this section receiving a Class III or Class IV sport fishery value.

Table 2. Average size of rainbow and brown trout during the fall in the Missouri River-Craig section for 1982-1988.

Age (Years)	Size at Age			
	Rainbow Trout		Brown Trout	
	Inches	Pounds	Inches	Pounds
1	9.1	0.35	10.4	.49
2	12.7	.90	14.2	1.17
3	15.3	1.32	17.0	2.00
4	17.0	1.65	19.8	3.11
5	18.3	2.09	22.3	4.15
6	---	---	24.6	4.64

SPAWNING

Rainbow trout spawning surveys indicate Little Prickly Pear Creek and the Dearborn River provide about 80% of the spawning habitat for the Missouri River population. In 1988, roughly 15,000 and 20,000 spawners used Little Prickly Pear and the Dearborn, respectively. Approximately 4,000 rainbow trout used the lower 4 miles of Sheep Creek and its South Fork in 1987. The importance of the Smith River as a spawning tributary is unknown but considered to be limited. Stickney, Wegner, Rock, and Hardy creeks, tributaries between Craig and Ulm, are known to support limited runs in some years but suffer from low natural flows. Available spawning for trout below Cascade appears to be limited to Sheep Creek. Tag returns identify Sheep Creek as spawning habitat for rainbow trout living in the river all the way to Great Falls.

Fish trapping and electrofishing in the fall, 1988 indicated extensive use of Little Prickly Pear Creek by Missouri River brown trout. Although no estimate of total numbers was obtained, the results suggest a substantial brown trout run. Sheep Creek receives some use by brown trout spawners but suffers from low natural winter flows. No brown trout spawning activity was observed in the Dearborn River during a survey in the fall, 1988.

Several problems currently face the major spawning tributaries for Missouri trout. On Little Prickly Pear Creek, irrigation practices, blockage by beaver dams, and land use activities reduce spawning success. Sheep Creek has an irrigation diversion near the mouth and a substantial timber sale currently occurring on private land within its North Fork. Numerous beaver dams hamper spawning migration in many years. Water temperature data indicate a suitable range for trout survival in Sheep and Little Prickly Pear creeks but maximum summer temperatures in the Dearborn River appear to be marginal. Severe dewatering and irrigation return flows contribute to this warming. Other problems in the Dearborn include land use practices and use of the stream bed for vehicular travel in low water periods.

ANGLER USE

Fishing pressure on the Missouri from Holter Dam to Cascade increased from 45,000 angler days per year in 1983 to over 70,000 per year in 1985 and 1986. The fishing pressure in 1985 and 1986 was higher than all other Montana rivers except the Madison. The majority of anglers were Montana residents and most were from Cascade (Great Falls area) or Lewis and Clark counties. About 10 to 20% of the anglers were from other Montana counties. Non-resident use increased from 8-11% of the anglers in the early 1980s to 14% in 1987. Non-resident use on other "blue ribbon" trout rivers east of the continental divide ranges from 23% to 91% with an average of about 45%. Fishing pressure from Cascade

to Great Falls was estimated at 14,400 days per year in 1983, 1985, and 1986.

Angler use on the river appears to be affected by residency and preferred angling method. More Cascade County residents fish immediately below Holter Dam and near Ulm using bait. Lewis and Clark County residents and non-residents are the primary users downstream from the Wolf Creek bridge to Cascade using flies and artificial lures. Fishing is mainly from boats in this reach. Guided trips have been most numerous from Wolf Creek bridge to Craig bridge, where they represented 19% of the total boat anglers in 1986. Most guided anglers are non-residents.

Recent catch rate information from the Craig and Cascade sections indicate an average of .45 rainbows were caught per hour and .06 brown trout, combined to total .51 trout per hour. Catch rates for total trout on other "blue ribbon" streams east of the divide ranged from .46 to .95. Catch rates for rainbows decrease progressively in a downstream direction, dropping to 0.14 trout/hour from Cascade to Ulm. Brown trout catch rates drop to .01 per hour in this section.

Harvest data collected in 1981 show anglers kept 42% of the rainbows caught and 17% of the browns. These percentages varied by river section. Almost all the rainbow and browns harvested were greater than 10 inches and over half were greater than 13 inches. Average length for harvested rainbows was 14.2 inches and 15 inches for browns.

Fishing from boats produced higher catch rates than fishing from the shore. Harvest rates for the two groups were identical indicating that boat anglers released a greater percentage of their catch. Fly fisherman had the highest catch rates and the lowest harvest rates, releasing about 90% of the trout caught. Lure and bait anglers experienced lower catch rates but harvested a much greater percentage of the catch.

Over the past six years, the use of artificial baits has doubled and catch rates for rainbow and brown trout have also increased on the Missouri. The number of rainbows kept per hour has decreased by 50% even though catch rates have increased. Numbers of brown trout kept per hour remains unchanged.

The 1987 creel census collected data on hatchery fish spilling from Holter Reservoir. Seventeen percent of the fish caught by river anglers immediately below the dam were hatchery trout originally planted in the reservoir. All of these fish were caught within 0.5 miles of Holter Dam and were caught only through June. In this low flow year, spilled hatchery trout concentrated immediately below the dam. They were harvested heavily by anglers and apparently did not survive long in the river environment. Higher flows might extend hatchery fish distribution downstream and later into the season.

ACCESS

There is substantial public access on the river between Holter Dam and Cascade. There are eight state recreation areas with boat access, one public campground owned by Montana Power, and a boat access at Cascade bridge. Most are developed with toilets and boat ramps and some have campgrounds. Average distance between these sites is 4 miles. A frontage road (old US Highway 91) has been designated as a recreation road and parallels the river from the Wolf Creek bridge to Great Falls.

Public access below the Cascade Bridge has been limited to an undeveloped county road access at Ulm and a city owned boat ramp in Great Falls. Transactions have recently been completed to acquire three state access sites. The first is located four river miles upstream from Ulm bridge. The second lies between Ulm bridge and the mouth of the Smith River and the last site is located 10 miles upstream from Great Falls.

SCOPING MEETING RESULTS

In November, 1988, a series of public scoping meetings were held to gather input into the management of the Missouri River from Holter Dam to Great Falls. The meetings were held on consecutive nights in Great Falls, Helena, and Bozeman. The meetings provided a public forum to discuss river and fishery management concerns and desires. Written comments were accepted through early December by the Department.

A total of 183 public comments were received concerning the future management, protection, and regulation of the fishery and recreation resource of the river (Appendix A). Twenty-five general comments centered around maintaining, improving, or enhancing a high quality and quantity fishery with wild trout stocks. Concern was voiced that fishery potential should dictate management and the fishery should be preserved but not at the expense of the local community. The 48 comments relating to fishing regulations included concerns over limits and/or size of trout kept; establishment of a special regulation or gear restriction section; and discrimination against an angling group, i.e. anglers who use bait. Other regulation concerns centered around outfitters and guides use of the river.

Commentors generally agreed that Missouri River spawners need protection. Seasonal fishing closures on spawning tributaries and the main stem near tributary mouths were recommended. Habitat protection and enhancement were also mentioned.

Other public concerns centered around enforcement of current regulations, boat use, horsepower restrictions, and fishing access sites and their development. Introducing warm water species in the river below Ulm to diversify the fishery was mentioned. Concern was voiced for the protection and maintenance of riverside vegetation and water quality through various means including better communication between county government and state and federal agencies, increased monitoring of subdivision activities, education, and acquisition of conservation easements. There was a general concern for maintaining flows in the river to preserve the habitat in the main stem and the side channels. Comments suggested educating the public on boating and bank fishing etiquette. The public generally supported the continuation of fish population studies and angler use surveys to monitor and maintain the fishery.

* * * * * * * * PROPOSED GOAL * * * * * * * *

From Holter Dam to Cascade, maintain and enhance for public use, a blue ribbon wild trout fishery dominated by rainbow trout with an opportunity to catch large trout. From Cascade to Great Falls, to maintain or enhance diverse fishing opportunities.

* * * * * * * * * *

+ + + + + OPTIONS AND MANAGEMENT ALTERNATIVES + + + + +

The management plan addresses three main issues: fish populations, fish habitat, and quality of the recreational fishing experience. Fish populations will be discussed by two river reaches: Holter Dam to Cascade and Cascade to Great Falls. For the upper river section, rainbow and brown trout will be discussed seperately.

* * * * * * FISH POPULATIONS-HOLTER DAM to CASCADE * * * * * *

* * * * RAINBOW TROUT * * * *

Option 1- Maintain Current Management

Maintain average fall population numbers and size composition of catchable rainbow trout at 2,200 per mile from Holter Dam to the Dearborn River and 1,000 per mile from the Dearborn River to Cascade. Catchable rainbow trout are defined as 10 inches and larger.

Fisheries management activities include maintaining current fishing regulations, monitoring populations using electrofishing surveys, continuing habitat protection measures, and monitoring spawning runs. The cost of fisheries management would not change. Opportunities to increase rainbow numbers may be reduced by this option. If a decline in rainbow trout numbers and/or size occurs in the future, changes in management and/or fishing regulations may be necessary.

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Option 2- Rainbow Trout Enhancement

Increase rainbow trout numbers by improving spawning success, protecting spawning fish, and/or regulating angler harvest. Enhancement measures would require redirecting existing personnel and/or acquiring new funds and studies. Consequently, other fisheries management programs may be postponed or abandoned.

Regulation of Angler Harvest

Current angler harvest on Missouri rainbows is not considered high compared to other Montana "blue ribbon" rivers. Annual mortality on 10 to 13 inch fish is relatively low, but angler harvest causes most of the mortality in this size group. As a fish ages and increases in size, mortality from natural causes also increases. By the time a fish is 17 inches or larger, most fish of this size die from natural causes rather than fishing mortality. If all or most of annual fish losses result from angler harvest, establishing a restrictive fishing regulation should increase rainbow numbers. If angling losses are small, the effectiveness of a fishing regulation is greatly reduced.

Recent data analysis suggests a restrictive fishing regulation could theoretically increase numbers of 13 to 17 inch rainbows. However, the numbers of rainbow trout in this size group appear to be fixed at a certain level in the Missouri. The number of young fish entering the population varies annually, ranging from 540 to over 2,000 fish per mile in the Craig section (Table 1). In most rivers, high numbers of young fish usually mean more larger fish a few years later. This does not appear to be true in the Missouri. By the time rainbows reach 3 years old (15 inches average length in the fall), their numbers consistently average 790 per mile, regardless of the original number of young fish. This "bottleneck" currently cannot be explained.

To summarize, the potential to increase rainbow numbers and/or size using more restrictive fishing regulations is limited by high natural mortality on larger fish, low angling mortality now, and the "bottleneck" described above.

Alternatives For Regulating Angler Harvest

1. **Maintain current regulation of 5 fish, 1 over 18 inches. Continue to evaluate rainbow trout populations and harvest. If necessary, propose new fishing regulations in 1991.**

   Advantages: Maintains current fishing opportunities. Current fishing regulations appear to be maintaining stable numbers of 16 inch and largerrainbows. Allows more time to thoroughly evaluate creel and fish population data. Avoids establishing regulations that may not be effective.

Disadvantages: Reduces opportunity to potentially improve rainbow numbers.

2. Establish a slot limit allowing 2 fish under 14 inches and 1 over 19 inches in an experimental section, 3 to 6 miles long.

Advantages: Would allow evaluation of a restrictive regulation. May increase overall numbers as well as larger rainbows. Will protect spawning sized rainbows.

Disadvantages: Reduces harvest opportunities. May not result in noticeable increases in overall rainbow numbers, including larger rainbows.

3. Establish experimental catch and release section, 3 to 6 miles long.

Advantages: Would be the most scientifically sound way to determine the impacts of angler harvest on rainbows and the capability of the river to produce large rainbows. Provides critical information for future management decisions. Restricts angling opportunities on only a small section of the river.

Disadvantages: Eliminates opportunities to harvest fish in experimental section. May concentrate anglers.

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Alternatives to Protect Spawning Rainbow Trout

Allowing more rainbow trout to spawn should increase the number of smaller fish (10 to 14 inches) in the river. Larger rainbows not harvested during the spring spawning period should be available during the summer fishing season. All of these measures would require changes that would further complicate fishing regulations. River spawners could also be protected through special fishing regulations discussed above.

1. Allow fishing in Dearborn River only during general fishing season (3rd Saturday in May to November 30).

Advantages: Protects almost half of all Missouri River rainbows while on spawning grounds. Would reduce trampling of spawning beds. Would prevent overharvest of spawners if fishing pressure increases in the future.

Disadvantages: Reduces fishing opportunity from December through May. May not significantly improve existing population because harvest levels appear to be low now.

2. **Catch and release on Dearborn River from December 1 to 3rd Saturday in May.**

Advantages: Protect rainbow spawners while providing some fishing opportunities. Prevents overharvest of spawners if fishing pressure increases in the future.

Disadvantages: Reduces current fishing opportunities. May create enforcement problems. Trampling of some spawning beds would continue. May not significantly improve existing population because harvest levels appear to be low now.

3. **Close Missouri River at mouths of major spawning tributaries from mid-February through mid-May.**

Advantages: Protect concentrations of pre-spawning rainbows.

Disadvantages: Reduces fishing opportunities. Difficult to permanently define and enforce area of closure.

4. **Open Missouri River only during general fishing season from the 3rd Saturday in May to November 30.**

Advantages: Closes river during rainbow spawning.

Disadvantages: Severely reduces fishing opportunities. May be overly restrictive since most spawning occurs in tributaries.

5. **Eliminate use of fish eggs for bait.**

Advantages: Prevents harvest of mature females for a bait source. Reduces harvest by eliminating a very effective fishing method.

Disadvantages: Reduces fishing opportunities. Requires additional enforcement effort. May not significantly increase rainbow numbers because use of method is now low.

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Alternatives to Improve Spawning Success

Most of Missouri rainbow trout spawn in three tributaries to the river. Irrigation practices, beaver dams, and dewatering currently reduce spawning success in these streams. Improving spawning success should increase numbers of smaller rainbows (10 to 14 inches) and stabilize numbers of young fish entering the population each year.

1. Remove beaver dams and/or modify irrigation diversion structures that create major barriers to spawning movements.

Advantages: Maintains access to major spawning tributaries. Relatively inexpensive to remove beaver dams. Could significantly increase spawning habitat availability.

Disadvantages: Could affect resident fish habitat. Modification of diversion structures could be costly.

2. Enhance minimum flows in major spawning tributaries used for irrigation through leasing of available water rights and encouraging more efficient water use.

Explanation: Enhancing instream flows by leasing water rights will be studied and reported to the Legislature in 1991.

Advantages: Prevent dewatering of key spawning tributaries.

Disadvantages: Could be expensive to lease water. Would involve complex negotiations and stream flow monitoring. May require further changes in state water law for permanent flow enhancement.

3. Determine fish losses caused by irrigation practices. Screen canals and/or pump inlets if acceptable, feasible, and losses are significant.

Advantages: Reduce losses of adult and young fish.

Disadvantages: May create maintenance problems and could be expensive.

4. Investigate spawning habitat improvement potential and flows in Rock, Wegner, Stickney, and Hardy creeks.

Advantages: May increase production of young rainbow trout.

Disadvantages: Low natural flows may limit potential for improvement.

* * * * BROWN TROUT * * * *

Option 1- Maintain Current Management

Maintain average spring population numbers and size composition of catchable brown trout at 160-270 per mile from Holter Dam to Cascade. Catchable brown trout are defined as 10 inches and greater.

Fisheries management activities include maintaining current fishing regulations, monitoring populations using electrofishing surveys, continuing habitat protection measures, and monitoring spawning runs. The cost of fisheries management would not change. Fishing harvest is currently an important factor limiting brown trout abundance. Consequently, increasing brown trout numbers would be restricted by this option.

If fishing pressure continues to increase and a decline in population numbers and/or growth is documented, changes in management and/or fishing regulations may be necessary.

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Option 2- Brown Trout Enhancement

Increase brown trout numbers by improving spawning success, protecting spawning fish, and/or regulating angler harvest. Enhancement measures would require redirecting existing personnel and/or acquiring new funds and studies. Consequently, other fisheries management programs may be postponed or abandoned.

Enhancing brown trout numbers could potentially impact rainbow numbers and/or size by competition for food and space and/or predation on rainbows. The potential for impacting rainbow numbers is slight because of abundant alternative food sources for brown trout such as sculpins, whitefish, and crayfish. Rainbow and brown trout interactions would be monitored.

Regulation of Angler Harvest

Numbers of catchable brown trout are small in comparison to rainbows in the Missouri River. Depending on the river section, rainbow trout are 5 to 10 times more numerous. However, brown trout comprise aabout two-thirds of the trophy trout fishery 18 inches and larger.

A substantial portion of the brown trout population is harvested each year because of their small population size and heavy angler pressure. Anglers harvest up to 60 to 70% of certain size groups of brown trout, causing overharvest to small as well as larger brown trout. In contrast, highest angler harvest on any size group of rainbows was 36%. Protecting younger as well as

older brown trout in the Missouri is necessary for a fishing regulation to have maximum effectiveness. Most of these alternatives would require changes that would further complicate fishing regulations.

Alternatives For Regulating Angler Harvest

1. Maintain current regulation of 5 fish, 1 over 18 inches.

Advantages: Maintains current fishing opportunities. Avoids complicating fishing regulations.

Disadvantages: Severely limits opportunity to significantly improve brown trout numbers and enhance trophy fishery.

2. Continue current regulations and use educational techniques designed to reduce brown trout harvest.

Advantages: Could potentially increase brown trout numbers without reducing angler opportunity. Avoids complicating fishing regulations.

Disadvantages: Increases in brown trout numbers not guaranteed and/or long-lasting. Not as effective as regulation.

3. Change current 5 fish limit to include only 1 brown trout.

Advantages: Would slightly improve overall brown trout numbers.

Disadvantages: Would not noticeably improve brown trout numbers because less than 1% of anglers keep more than one brown trout now. Could actually increase harvest by setting goal for anglers.

4. Slot limit to allow harvest of 1 brown trout under 11 inches and 1 over 18 (or 20 or 22 or 24) inches.

Advantages: Could increase overall brown trout numbers if harvest on small fish does not increase.

Disadvantages: Slot has to be so wide to protect small and large brown trout that it reduces majority of angler harvest. Focuses excessive harvest on small brown trout.

5. **Allow harvest of one brown trout which must exceed 18 inches (or 20 or 22 or 24 inches).**

Advantages: Could substantially increase brown trout numbers, particularly larger trout. Allows most fish to spawn once prior to reaching legal size. Affects only small portion of angling public because less than 10% of anglers currently keep a brown trout.

Disadvantages: Reduces harvest opportunities.

6. **Catch and release all brown trout.**

Advantages: Could substantially increase brown trout numbers, particularly larger trout. Increases slightly higher than Alternative #5.

Disadvantages: Eliminates all harvest opportunities on brown trout. Benefits to the population are not significantly greater than Alternative #5.

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Alternatives to Protect Spawning Brown Trout

Allowing more brown trout to spawn would help maximize production of young fish and increase overall brown trout numbers including larger trout. River spawners could also be protected by special fishing regulations discussed above. Most of these alternatives would require changes that would further complicate fishing regulations.

1. **Close Little Prickly Pear Creek to fishing from September 1 to the third Saturday in May.**

Advantages: Protects a major portion of all Missouri River brown trout while on spawning grounds. Prevents trampling of spawning beds.

Disadvantages: Reduces fishing opportunities by closing creek on September 1 rather than November 30.

2. **Close Missouri River at mouth of Little Prickly Pear Creek from September 1 through November 15.**

Advantages: Protect concentrations of pre-spawning browns. Would not discriminate against any angling methods.

Disadvantages: Reduces fishing opportunities. Difficult to permanently define and enforce area of closure, particularly for floaters.

3. Catch and release in Missouri River at mouth of Little Prickly Pear Creek from September 1 through November 15.

Advantages: Protect concentrations of pre-spawning browns while providing some fishing opportunities. Would not discriminate against any angling methods.

Disadvantages: Reduces current fishing opportunities. May create enforcement problems. Difficult to permanently define and enforce area of closure, particularly for floaters.

4. Catch and release of brown trout in Missouri River after September 1 through November 15.

Advantages: Protect spawners while providing some fishing opportunities.

Disadvantages: Reduces current fishing opportunities. May create enforcement problems.

5. Prohibit use of fish eggs for bait in the Missouri River.

Advantages: Prevents harvest of mature females for a bait source. Reduces harvest by eliminating a very effective fishing method.

Disadvantages: Reduces fishing opportunities. Requires additional enforcement effort. May not significantly increase brown trout numbers because use of method is now low.

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Alternatives To Improve Spawning Success

Little Prickly Pear Creek and Missouri River side channels have been identified as major spawning and rearing areas for the river's brown trout population. Assuring access and improving spawning and rearing habitat in Little Prickly Pear Creek, enhancing other spawning areas, and maintaining main stem spawning habitat would help maximize production of young brown trout. Overall brown trout numbers and numbers of larger brown trout should increase as a result of these measures.

1. **Maintain access to Little Prickly Pear Creek in the fall by removing beaver dams and modifying irrigation diversion structures (with landowner permission) if needed.**

Advantages: Relatively inexpensive to remove beaver dams. May increase spawning habitat availability. May increase survival of spawners by reducing concentrations below barriers.

Disadvantages: Modification of diversion structures could be expensive.

2. **Enhance minimum flows in Little Prickly Pear Creek through leasing of available water rights and encouragement of more efficient water use.**

Explanation: Enhancing instream flows by leasing water rights will be studied and reported to the Legislature in 1991.

Advantages: Would prevent dewatering of key spawning tributary.

Disadvantages: Could be expensive to lease water. Would involve complex negotiations and stream flow monitoring. May require further changes in state water law to provide permanent flow enhancement.

3. **Determine fish losses in Little Prickly Pear Creek caused by irrigation practices. Screen canals and/or pump inlets if acceptable, feasible, and losses are significant.**

Advantages: Would reduce losses of adult and young fish.

Disadvantages: Could be expensive and may create maintenance problems.

4. **Investigate potential for improving spawning habitat in main stem and in other tributaries.**

Advantages: May increase production of young trout.

Disadvantages: Potential unknown.

5. **Encourage main stem flows of at least 4,100 cfs.**

Advantages: Maintains important side channel spawning and rearing areas.

Disadvantages: May not be possible in low water years. Could impact power production and recreational opportunities at Canyon Ferry by causing drawdowns.

* * * * * BAIT RESTRICTIONS AND EXPERIMENTAL SECTIONS * * * *

Most special regulations on Montana rivers include a restriction on the use of bait. These regulations typically increase the numbers of fish that must be released after being caught. A summary of hooking mortality studies conclude trout caught and released using bait suffered 25% mortality compared to 6% for lures and 4% for flies. Hooking mortality was calculated for the Craig section using 1986 creel data. Over 80% of the anglers used flies or lures, 16% used bait, and 5% used a combination of bait and lures. When these percentages are weighted using published hooking mortality rates, we estimated about 10% of the trout caught and released would die from hooking. If bait was banned, about 5% of the trout caught and released would die from hooking injuries.

Management Alternatives

1. Allow bait use with any special fishing regulations that might be established for rainbow or brown trout.

Advantages: Maintain fishing opportunities to entire angling public. Should not significantly affect trout population response to special fishing regulations. Avoids complicating fishing regulations. Would not require further enforcement efforts to monitor bait type.

Disadvantages: Slightly reduces overall trout population response to special fishing regulation. Population increases would be slightly slower and lower.

2. Establish special regulations only in an experimental section.

Advantages: Does not cause loss of harvest opportunity on entire river.

Disadvantages: Entire river's trout population would not realize positive effect (if it occurs) from special regulation. May create enforcement problems and would require additional enforcement effort. May require establishing a new trout population monitoring section which would increase management costs.

* * * * * * FISH POPULATIONS-CASCADE to GREAT FALLS * * * * *

The 26-mile river stretch from Cascade to the Smith River meanders through flat prairie and ranch country. Rainbow and brown trout and mountain whitefish continue to dominate the sport fishery but overall numbers are much lower than in the upper river. Other game species include burbot (ling) and walleye. Catch rates for rainbows decrease progressively in a downstream direction, dropping to 0.14 trout/hour in this reach compared to .45 trout/hour in the Craig section. Brown trout catch rates drop from .06 per hour in the upper section to .01 per hour below Cascade.

Little is known of the fishery in the 29-mile section of the river between the mouth of the Smith River and Great Falls. This reach is a transitional zone between the cold-water fishery above Ulm and the warm-water fisheries below Great Falls. Rainbow and brown trout numbers are limited and mountain whitefish are common. Walleye and burbot also contribute to the fishery.

Available spawning habitat for trout below Cascade appears to be limited. Tag returns identify Sheep Creek as a key spawning tributary for rainbow trout living in the river to Great Falls.

Three new access sites have recently been acquired below Cascade. The first is located four miles upstream from the Ulm bridge, the second is at the mouth of the Smith River, and the last one is 10 miles upstream from Great Falls. Plans for the sites are currently being developed by DFWP staff.

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Option 1- Maintain Current Management

Current management consists of habitat protection using streambed protection laws and development of recently acquired access sites.

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Option 2- Expansion of trout and/or diversification of warm/cool water species

Management Alternatives

1. Inventory fish populations and physical habitat between Ulm and Great Falls.

Advantages: Identifies recreational fisheries potential and determines suitability of habitat for various fish species.

Disadvantages: None.

2. Evaluate potential for enhancing warm/cool water species including smallmouth bass and walleye.

Advantages: Diversifies fishery and expands fishing opportunities.

Disadvantages: Could be detrimental to trout population in the upper river. Availability of hatchery fish may be limited.

3. Enhance trout spawning opportunities in Sheep Creek and investigate potential for creating or enhancing other trout spawning areas.

Advantages: Could increase numbers of rainbow trout.

Disadvantages: Potential unknown.

4. Enhance rainbow trout population with hatchery plants.

Advantages: Increase fishing opportunities in marginal habitat close to Great Falls.

Disadvantages: May not be cost effective. Could detrimentally affect wild trout populations in upper river.

* * * * * * * FISH HABITAT * * * * * * *

Flows and Habitat Protection

Missouri River trout are a wild, self-sustaining population not supplemented by hatchery stocks. Therefore, adequate flows in the river for spawning and rearing areas are essential for population maintenance. Ongoing measures for protecting instream flows include cooperating with Montana Power Company and the Bureau of Reclamation to maintain desirable minimum flows; defending existing instream water rights and applying to reserve instream flows as part of the Missouri River Water Reservation; and attempting to secure long term flow commitments from Montana Power Company (MPC) to insure minimum flows and minimize flow fluctuations below Holter Dam. The future relicensing of Holter Dam will allow the Department to recommend flows to protect fish and wildlife resources.

Other ongoing habitat protection measures include maintaining instream flows in tributaries by reviewing water right applications and other water development projects, assisting in enforcement of stream habitat protection laws on the river and tributaries, and providing portable diversion structures as an alternative to bulldozing streambed gravel to form irrigation dams.

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Corridor Protection/Land Use

The vegetation along a river's banks (riparian area) provides some of the most productive wildlife habitat, contributes to fish cover and shade, helps stabilize banks from erosion, and enhances the aesthetic quality of the river. Maintaining the health of riparian vegetation is critical to sustaining a river corridor's natural resource values.

The Missouri's corridor is probably the most heavily developed of any blue ribbon trout stream in the state. Land splits and development have occurred extensively on the upper river and the pace of unreviewed subdivision has recently accelerated below Cascade. The majority of the Missouri River corridor is privately owned and changes in land use and ownership will continue to occur. Lewis and Clark and Cascade counties are responsible for subdivision and land development regulation within the corridor. No special regulations and/or considerations are in place for the river corridor now.

Management Alternatives

1. Survey angler opinion on the need for special riparian protection measures. If justified, provide input to Cascade and Lewis and Clark county governments on the creation of setback policies, development standards, and other corridor protection avenues.

Advantages: Preserves natural streamside habitat and aesthetics.

Disadvantages: None.

2. Investigate opportunity to use River Restoration Fund for conservation easements on key spawning areas and on the main stem from Holter Dam to the Dearborn River and from Sheep Creek to Great Falls.

Explanation: The River Restoration Fund was passed by the 1989 Legislature. The bill added $.50 to a resident fishing license and $1.00 to a non-resident fishing license creating a fund for restoring and reclaiming damaged streams in the state.

Advantages: Prevents potentially damaging streamside activities in key spawning and rearing areas while preserving current land uses and ownership.

Disadvantages: Could be costly and may require changes in legislation to allow use of this fund to acquire conservation easements.

3. Promote and provide public education on protection and reclamation of streamside (riparian) habitat zones by:

a. Exposing benefits of good riparian management to river bank land owners.

b. Cooperating with sporting clubs and landowners to develop projects for revegetating rip rap and repairing damaged and unstable streambanks.

c. Developing standards with conservation districts for river bank alterations by home owners.

Advantages: Involves landowners and river users in protecting streamside vegetation. Involves no new regulations. Encourages voluntary participation. Could significantly improve riverside trout cover.

Disadvantages: None.

* * * * * QUALITY OF RECREATIONAL EXPERIENCE * * * * *

User Conflicts

Comments made at public meetings suggest most people favor promoting proper 'river etiquette' rather than regulating floating. In 1986, shore and boat fishing pressure were nearly equal in the Craig section. Conflicts appear to be accelerating between commercial outfitters and the public due to increased outfitter use. The outfitting industry is no longer controlled by the DFWP. The Department of Commerce recently acquired these responsibilities.

Management Alternatives

1. **Use brochure, signs, or media messages to promote proper river etiquette.**

   Advantages: Reduces conflict between shore and boat anglers. Avoids establishing unnecessary floating restrictions.

   Disadvantages: May not be effective.

2. **Limit floating use in heavily used river reaches.**

   Advantages: Reduces user conflicts.

   Disadvantages: Reduces angling opportunities to floaters. May be overly restrictive at this time. May increase landowner conflicts with shore anglers seeking river access. Would require increased enforcement effort.

3. **Control outfitter use through regulation.**

   Advantages: Reduces user conflicts.

   Disadvantages: May adversely affect Montana's tourism industry. May be overly restrictive at this time. Does not give outfitters opportunity to regulate themselves. May require new legislation.

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Motor Boat Use

There are no special boating restrictions on the Missouri River between Holter Dam and Great Falls now. Jet boats, motor boats of all sizes, rubber rafts, john boats, canoes, and the occasional float tube or inner tube are current means of recreational boating. Heavy use by motor boat can destroy weed beds and destabilize river banks by wave action.

Motor restrictions are enforced on many of the more popular rivers in Montana. Motors are not allowed on the Bighorn, Smith, and Big Hole rivers. No motors larger than ten horsepower are allowed on most major rivers in southwestern Montana. The Wild and Scenic portion of the Missouri from Ft. Benton to Judith Landing allows motor use in a downstream direction only with no wake from the weekend before Memorial Day and the weekend after Labor Day. Other larger rivers such as the Flathead, Clark Fork, and Kootenai do not have a restriction on motorized use.

The majority of public comment on motor use suggested restricting use seasonally or to certain reaches of the river. In most cases, safety was the reason for the suggested restrictions. Most of the management alternatives for motor boat use would further complicate boating regulations.

Management Alternatives

1. Maintain current management with no restrictions on motorized use.

Advantages: Avoids complicating boating regulations. Does not discriminate against any user group.

Disadvantages: May increase conflicts between user groups. Existing bank erosion caused by boat wave action would continue.

2. Allow motorized travel only in a downstream direction with no wake.

Advantages: Would not eliminate use of any type of boat or establish motor restriction. Could reduce erosion on unstable banks.

Disadvantages: Would eliminate all upstream travel and would require boat shuttling. Would affect current river use by riverbank landowners with motor boats.

3. **Restrict motor use to a particular river reach and/or season.**

Advantages: Reduces motor use only in areas and/or seasons where conflicts exist now.

Disadvantages: Reduces power boating opportunities. Could affect current use by riverbank landowners. Would increase enforcement effort.

4. **Restrict motor size to 10 horsepower or less.**

Advantages: Reduces disturbance to anglers. Minimizes loss of streambank habitat from boat wave action.

Disadvantages: Eliminates use of river by certain members of public. May be overly restrictive. Slow upstream travel may aggravate existing user conflicts.

5. **Eliminate all motorized use.**

Advantages: Eliminates disturbance to anglers. Eliminates loss of streambank habitat from boat wave action.

Disadvantages: Loss of motorized use greatest with this alternative. May be overly restrictive. Eliminates use of river for transportation by river bank landowners. Would increase boat shuttling for upstream travel.

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Access

There is substantial public access on the river between Holter Dam and Cascade. Eight state recreation areas, one public campground owned by Montana Power Company, and a boat access at Cascade bridge provide public access now. Some are developed with campgrounds and most have toilets and boat ramps. In addition, a frontage road (old US Highway 91) has been designated as a recreation road paralleling the river from Wolf Creek bridge to Great Falls.

Until recently, public access below Cascade has been limited to an undeveloped county road access at Ulm and a city owned boat ramp in Great Falls. Transactions acquiring three state access sites are now completed. The sites are located 4 river miles upstream from Ulm bridge, between Ulm bridge and the mouth of the Smith River, and 10 miles upstream from Great Falls.

Management Alternatives

Acquisition of new access sites.

1. **No new access sites.**

   Advantages: Would require no additional acquisition cost. Current accessibility would be maintained. Maintains opportunity for relative solitude in more remote river reaches.

   Disadvantages: Would reduce opportunity to disperse recreational use. Continues to limit public access in some areas.

2. **Acquire new sites where determined appropriate.**

   Advantages: Would help disperse recreational use. Could considerably shorten existing float time in some reaches. Could result in more effective utilization of fishery resource.

   Disadvantages: Disturbance to adjacent landowners at new site. Development, maintenance, and acquisition costs. Could result in overharvest of limited fishery resource. May reduce opportunities for relative solitude in some river reaches.

Access Site Development

1. Develop access sites according to public needs and funding constraints.

Advantages: Allows public input into access site development.

Disadvantages: None.

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Enforcement

Management Alternatives

1. **Maintain current enforcement level.**

   Advantages: No additional cost or reassignment of warden duties from another part of region.

   Disadvantages: Current level of noncompliance with fishing regulations would continue.

2. Request more time from existing warden during peak use season.

Advantages: Increases visibility of warden. Encourages wise use of fishery and recreational resources.

Disadvantages: Warden may have to neglect duties in other part of region normally assigned to.

3. Assign additional enforcement personnel to the river from June through September.

Advantages: Increases visibility of warden. Encourages wise use of fishery and recreational resources.

Disadvantages: Costly. Could require reassigning warden from another part of Region 4. May not be necessary now.

4. Establish a river ranger position on the river.

Advantages: Someone on river throughout the peak fishing season. Deals with all recreation questions, not just enforcement. Could prevent future user conflicts and monitor user satisfaction. Current warden's duties would not increase or be rearranged.

Disadvantages: Costly. River ranger position needs authorization of legislature. If additional funds are not secured, redirection of existing funds would have to occur. May not be necessary.

APPENDIX

SUMMARY OF PUBLIC COMMENT

Summary of Missouri River public comment-oral and written

The comments received at the public meetings held in November in Great Falls, Helena, and Bozeman are summarized into 12 groups. There were a total of 183 comments on the Missouri River Management Plan. The comments were broken into 11 categories with regulations having two subcategories. The categories and the number of comments in each are listed below. A summary of comments by category will follow.

Category	Number of Comments
Management of Trout	25
Regulations	
Limit and or gear related	48
Other than limits and gear	7
Spawning	22
Enforcement	10
Boating	17
Access	8
Stocking, introduction of warm water species	9
Corridor protection, land use, water quality	14
River flows	8
Social conflicts/educational	6
Monitoring and personnel	9
Total	183

Management of Trout

Twenty-five comments were considered management objectives which did not contain specific strategies. The comments generally centered around maintaining, improving, or enhancing a high quality and quantity trout fishery through wild stocks of trout. Concern was voiced by several individuals that the fishery should dictate the management and the biological reality of the river should be given priority over public opinion and individual preference of gear and limits. Others felt the fishery should be preserved through more stringent regulations if necessary but not at the expense of the local community. Others wanted to maintain the fishery without any further regulations. The establishment of a steering committee of user groups prior to the release of the draft was also suggested.

Regulations-limit and/or gear related

Of the 48 comments related to limit and/or gear regulations, the comments were divided between specific regulations as to the number and/or size of trout kept; maintaining a stretch of river with special regulations and restricted gear; and the discrimination against bait fisherman. Of the 21 comments suggesting regulations on the number and/or size of trout, only one wanted a liberalization of the limit. The other 20 comments wanted either a reduced limit to 2 or 3 fish with one over 18" or a slot limit protecting the 13 to 22 inch fish by catch and release but allowing for a trophy fish to be

kept. Seven comments specifically mentioned brown trout restrictions which would protect browns but allow for keeping trophy size fish. Two comments specifically mentioned rainbow trout.

Stretches of river were mentioned in many of the comments where more stringent regulations should be enforced and usually involved some stretch from Holter Dam to Cascade (one comment wanted catch and release all the way from the dam to Great Falls). Specific gear restrictions of artificial flies or lures and regulations were usually suggested for a short stretch of river and the Wolf Creek Bridge to Craig was the most frequently suggested reach. Barbless and single hooks were suggested and several comments wanted several reaches of river to have different regulations and gear restrictions to determine which restrictions were most appropriate for the fishery.

Seventeen comments wanted no change in current regulations and/or if there were more stringent regulations placed on limits and/or size that the regulations should effect all anglers and not discriminate against the bait fisherman. Several comments felt a change in regulations should occur if the fishery warranted and public opinion should than be disregarded. Several voiced concern about fishing hours and applying more stringent regulations to out-of-staters first.

Regulations-other than limits and gear

Of the seven comments concerning regulations other than gear and limits, most centered around outfitters and guides and their use of the river. There was a general feeling that commercial use was a major factor affecting fishing pressure and that there was a need to divide the river into float and wading sections or regulate a floater's ability to get out of his/her boat.

Four comments suggested that there should be no restrictions of any kind on the river.

Spawning

Of the 22 comments on spawning, there was a general agreement that spawners need to be protected. Fishing closures were recommended by the majority of the comments for spawning tributaries and the main stem near the mouth of tributaries during the brown and rainbow spawning periods. The Dearborn River, Little Prickly Pear Creek and Sheep Creek were specifically mentioned as areas that needed seasonal closures. Many felt that closures should pertain to all types of fishing and streams should not be left open to specific types of angling and restricted to others. Maintenance of stream flows and removal of dams were also specifically mentioned to protect and encourage successful spawning.

Enforcement

There was a general concern among the 10 comments on enforcement that the fishing public was not abiding by the current regulations and additional enforcement was needed in the Holter Dam to Cascade area. More specific comments suggested that a game warden should be assigned to the river during the peak fishing season; that the activities of commercial guides and bait

fishermen that camp for weeks on the river should be more closely monitored; and that if a warden was around more and the current regulations were more stringently enforced, the fishery would be sufficiently protected by current regulations and management.

Boating

Of the 17 comments on boating, only 2 wanted no restrictions on motorized boat use. The other comments felt that some restriction or limit on horsepower should be enforced during the peak fishing season and/or on some stretch of the river. Horsepower restrictions of 10 or 20 hp were suggested and stretches recommended for restrictions included Wolf Creek to Mountain Palace, Holter Dam to Prewett Creek, Wolf Creek bridge to Craig bridge, and Holter to Pelican Point.

Access

The issues raised concerning access ranged from limiting access to protect the fishery to more access with specific concerns for the handicapped. There was concern voiced for evening out the pressure on the river through locations of access and the need for more access below Cascade. Others felt different levels of access could be developed including restrictions to foot access only.

Stocking, introduction of warm water species, strain evaluation

Five comments recommended that diversification of the fishery including the introduction of warm water species should be considered and/or investigated. Warm water species mentioned included walleye and smallmouth bass. Two comments wanted no stocking in the river and 2 others suggested an evaluation of the rainbow strain in the river be conducted to determine if some other strain would be longer-lived (based on the perception that there are low numbers of rainbow trout over 18").

Corridor Protection/Land Use/Water Quality

Of the 14 comments, 12 were concerned with the protection and maintenance of the integrity of the riparian zone. Suggestions for corridor protection included a policy statement from the DFWP; new communication network investigated between county commissioners and state and federal agencies; better monitoring of subdivision activities, clearing and other forms of development; and investigations of acquisition of conservation easements. Concern for maintaining water quality was also mentioned and graduate studies were suggested to address some of these corridor and water quality protection issues.

River flows

There was a general concern for maintaining flows in the river below Holter Dam that would preserve the habitat in the main stem and the side channels. Formalizing a flow management agreement with MPC was suggested. One comment wanted the lower flows of the last two summer be maintained because of the fishing quality that resulted.

Social conflicts/educational

The comments centered around the need to educate the public to boating and bank fishing etiquette, the creation of a catch and release mentality, and public education on fish identification and the fish environment in general.

Monitoring and personnel

Of the 9 comments regarding biological monitoring, only one wanted to stop the shocking program entirely; the other 8 wanted fish population studies to either increase in frequency or expand the number of study areas. There was a general feeling that fish population studies and use surveys were necessary to monitor and maintain the fishery. There was a suggestion that the biological carrying capacity of the river be determined.

APPENDIX B

QUESTIONNAIRE ADDRESSING

THE MISSOURI RIVER MANAGEMENT PLAN ALTERNATIVES

MISSOURI RIVER

USER SURVEY

A questionnaire addressing management alternatives for the Missouri River from Holter Dam to Great Falls

* * * * * GENERAL QUESTIONS * * * * *

1. How many days per year do you fish or recreate on the Missouri River?

____ None
____ Less than three days
____ Between three and seven days
____ Between seven and ten days
____ More than ten days

2. What section(s) of the river do you use most frequently? (pick more than one if necessary)

____ Holter Dam to Wolf Creek bridge
____ Wolf Creek bridge to Craig bridge
____ Craig bridge to Dearborn River
____ Dearborn River to Mountain Palace
____ Mountain Palace to Pelican Point
____ Pelican Point to Cascade
____ Cascade to Ulm
____ Ulm to Great Falls

3. What angling method(s) do you use when you fish? (Check all that apply)

____ Bait
____ Lures
____ Flies
____ Combination lures and bait
____ I don't fish

4. If you fish on the Missouri, how often do you fish:

	From Shore	From a Boat	With a Guide
Almost always	____	____	____
Most of the time	____	____	____
Some of the time	____	____	____
Almost never	____	____	____
Never	____	____	____

5. What species of fish do you most often seek to catch in the Missouri River?

____ Rainbow trout
____ Brown trout
____ Whitefish
____ Burbot (ling)
____ Walleye
____ No preference
____ Other (please specify _____)

6. Based on your experience, which of the following are major problems on the Missouri River? (Please check no more than 4)

____ The regulations are too strict
____ The regulations are too liberal
____ Not enough rainbows
____ Not enough browns
____ Too many anglers
____ Too few fish
____ The fish that are caught are too small
____ There are too many floaters
____ Diversity of fishing opportunity is poor
____ Enforcement of fishing regulations is inadequate
____ The flows are too high
____ The flows are too low
____ Fishing access is inadequate
____ There are too many homes along the banks
____ The river banks are in bad shape
____ Too many outfitters
____ Too many motor boats
____ Other (specify)_____

7. Current angler harvest on Missouri rainbows is not considered high. Most fish over 17 inches appear to die from natural causes rather than angler harvest. Natural limiting factors appear to stabilize the number of rainbows from 14 to 17 inches regardless of the number of young fish spawned each year. The potential to increase rainbow numbers and/or size through more restrictive fishing regulations seems to be limited because of these factors. However, it is very difficult to predict the effectiveness of any special fishing regulation without field testing. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ **Maintain current fishing regulations.** Continue to evaluate rainbow trout populations and harvest. If necessary, propose new fishing regulations in 1991. Current fishing regulations appear to be maintaining stable numbers of 16 inch and larger rainbow.

____ **Establish a slot limit allowing 2 fish under 14 inches and 1 over 19 inches in an experimental section.**

____ **Establish an experimental catch and release section.** This would be the most scientifically sound way to determine the impacts of angler harvest on rainbows and the capability of the river to produce large rainbows.

8. Please look back over question 7 and circle the action that you favor most (if any).

9. Allowing more rainbow trout to spawn should increase the number of smaller fish (10 to 14 inch) in the river. Also, some larger rainbows not harvested during the spring spawning period should be available to river anglers during the summer fishing season. However, all of these measures would further complicate fishing regulations. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ **Close Dearborn River to fishing from November 30 to 3rd Saturday in May (it is currently open year round).** Would protect nearly half of all Missouri River rainbows while on spawning grounds but may not significantly improve existing population because harvest levels in the Dearborn appears to be low now.

(more alternatives on next page)

____ Catch and release on the Dearborn River December through 3rd Saturday in May.

____ Close Missouri River at mouths of spawning tributaries. Would protect concentrations of pre-spawning rainbows but may be difficult to enforce area of closure for floaters.

____ Open Missouri River only during general fishing season (3rd Saturday in May through November) instead of year round.

____ Eliminate use of fish eggs for bait. Prevents harvest of mature females for a bait source but may not be necessary because use of method is relatively low now.

10. Please look back over question 9 and circle the action that you favor most (if any).

11. Most Missouri River rainbow trout spawn in Little Prickly Pear Creek, the Dearborn River, or Sheep Creek. Improving spawning success should stabilize the number of young rainbows coming into the population each year and should increase the numbers of catchable rainbows from 10 to 14 inches. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ Remove beaver dams and/or modify irrigation diversion structures (with landowner permission) that create major barriers to spawning movements.

____ Enhance minimum flows in spawning tributaries by leasing available water rights and encouraging more efficient water use.

____ Determine fish losses caused by irrigation practices and screen canals and/or pump inlets if losses are significant.

____ Investigate spawning habitat in other tributaries.

12. Please look back over question 11 and circle the action that you favor most (if any).

* * * * * * *

* * * * BROWN TROUT * * * *

13. Rainbow trout are 5 to 10 times more numerous than brown trout in the Missouri River. However, brown trout comprise about two-thirds of all trout larger than 18 inches. Anglers harvest 60 to 70% of all catchable brown trout 10 inches and larger, causing heavy harvest on small as well as larger brown trout. Protecting younger as well as older brown trout in the Missouri is necessary if a special fishing regulation is to have maximum effectiveness.

Increasing brown trout numbers could potentially impact rainbow numbers. Although this possibility is considered to be unlikely, it would be monitored. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ **Maintain current fishing regulations.** Would probably maintain a stable but low brown trout population. Severely limits opportunity to significantly improve brown trout numbers and enhance trophy fishery.

____ **Continue current regulations and use educational techniques designed to reduce brown trout harvest.**

____ **Change current 5 fish limit to include only 1 brown trout.** Would not noticeably improve brown trout numbers because less than 1% of anglers keep more than one brown trout now.

____ **Slot limit to allow harvest of 1 brown trout under 11 inches and 1 over 18 (or 20 or 22 or 24) inches.** Population could improve if harvest on small fish does not increase. May focus excessive harvest on small brown trout (Circle upper size limit you prefer.)

Allow harvest of one brown trout which must exceed:

____ 18 inches — Could substantially increase brown trout numbers, particularly larger fish. Allows most fish to spawn once prior to reaching legal size. Affects only small portion on angling public because less than 10% of anglers currently keep a brown trout.

____ 20 inches — More effective than 18 inch

____ 22 inches — More effective than 20 inch

____ 24 inches — More effective than 22 inch

____ **Catch and release all brown trout.** Gives maximum population response but eliminates all harvest.

14. Please look back over question 13 and circle the action that you favor most (if any).

15. If you favor a special regulation for brown trout, where do you want it? (please check one)

____ on the entire river (Holter Dam to Cascade)

____ in an experimental section only

16. Little Prickly Pear Creek and Missouri River side channels are the major spawning areas for brown trout. Allowing more brown trout to spawn would maximize production of young fish and would probably increase overall brown trout numbers including larger trout. River spawners could also be protected by the special fishing regulations discussed above. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ Close Little Prickly Pear Creek to fishing from September 1 to the third Saturday in May (currently closed from November 30 to 3rd Saturday in May).

____ Close Missouri River at mouth of Little Prickly Pear Creek from September 1 through November 15.

____ Catch and release in Missouri River at mouth of Little Prickly Pear Creek from September 1 through November 15.

____ Catch and release of brown trout in entire Missouri River between September 1 and November 15.

____ Eliminate use of fish eggs for bait.

17. Please look back over question 16 and circle the action that you favor most (if any).

18. Assuring access and improving spawning habitat in Little Prickly Pear; enhancing other spawning areas; and maintaining main stem habitat would help maximize production of young brown trout. Overall brown trout numbers and numbers of larger brown trout should increase as a result of these measures. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ Remove beaver dams and modify irrigation diversion structures (with landowner permission) in Little Prickly Pear Creek.

____ Enhance minimum flows in Little Prickly Pear Creek by attempting to lease available water rights.

____ Determine fish losses in Little Prickly Pear Creek caused by irrigation practices and investigate feasibility and acceptability of screening canals and/or pump inlets if losses are significant.

____ Investigate potential spawning habitat in main stem other tributaries.

19. Please look back over question 18 and circle the action that you favor most (if any).

* * * * * * BAIT RESTRICTION * * * * *

20. A summary of most published hooking mortality studies concludes that trout caught and released using bait suffer 25% mortality compared to 6% for lures and 4% for flies. The net loss of trout from catch and release bait fishing would probably not be high enough to jeopardize the effectiveness of a special regulation on the Missouri. The number of anglers that fish with bait is relatively low and they typically catch significantly fewer trout than those who use artificials. Although it is higher in certain seasons, on the average only about 25% of the anglers use bait. If bait use is allowed, fishing opportunities would be maintained to the entire angling public. By restricting bait use, trout population response to a special fishing regulation would probably be slightly higher and faster. Please indicate your feelings about the following possible action using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ Allow bait fishing in any "special regulation" section.

* * * * * * *

* * * * * * FISH POPULATIONS-CASCADE to GREAT FALLS * * * * * *

21. Rainbow and brown trout continue to dominate the sport fishery in the 26-mile river stretch from Cascade to the Smith River but overall numbers and catch rates are much lower than in the upper river. Little is known of the limited fishery from the Smith River to Great Falls. Sheep Creek is known to be an important spawning area for rainbows all the way to Great Falls. The trout population in the upper river may be negatively affected by the stocking of warm/cool water species or hatchery rainbow trout. However, the existing fishery resource in the lower river could be enhanced by these alternatives. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ Maintain current management consisting of habitat protection and development of recently acquired fishing access sites near Ulm and Great Falls.

____ Inventory fish populations and physical habitat between Ulm and Great Falls to determine suitability for warm/cool species.

(more alternatives on next page)

____ Evaluate the potential for enhancing warm/cool water species including smallmouth bass and walleye.

____ Enhance trout spawning opportunities in Sheep Creek and investigate the potential for creating or enhancing other trout spawning areas.

____ Attempt to enhance trout populations with hatchery rainbow plants in selected areas.

22. Please look back over question 21 and circle the action that you favor most (if any).

* * * * * * * * * *

* * * * * * * FISH HABITAT * * * * * * *

Flows and Habitat Protection

Adequate flows in the river to maintain trout spawning and rearing areas are essential for sustaining the wild trout population in the Missouri. Current Department activities protecting instream flows include cooperating with dam operators to maintain minimum flows, defending existing instream water rights, and applying to reserve instream flows. Other ongoing habitat protection measures include maintaining instream flows in tributaries and assisting in enforcement of stream habitat protection laws.

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Corridor Protection/Land Use

The vegetation along a river's banks (riparian zone) provides some of the most productive wildlife habitat, contributes to fish cover and shade, helps stabilize banks from erosion, and enhances the aesthetic quality of the river. Maintaining the health of riparian vegetation is critical to sustaining the corridor's natural resource values. The majority of the Missouri River corridor is privately owned and changes in land use and ownership will continue to occur in the future. Lewis and Clark and Cascade counties are responsible for subdivision and land development regulation within the corridor.

23. Do you feel that degradation of the riparian zone is a major problem on the Missouri?

_____ Yes ____ No

24. Do you feel that the current land development regulations are adequately protecting the Missouri River corridor?

_____ Yes _____ No

25. Would you support more stringent development standards for the river corridor if the counties and/or conservation districts considered adopting such standards?

_____ Yes _____ No

26. Do you own land along the Missouri River?

_____ Yes _____ No

27. Please indicate your feelings about the following possible actions that could be taken to protect the river corridor using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

_____ Investigate opportunity to use River Restoration Fund for conservation easements to preserve undeveloped riparian corridors on key spawning areas and along main stem reaches.

_____ Promote and provide public education on protection of streamside habitat zones to river bank landowners, sporting clubs and conservation districts.

_____ Develop cooperative riverbank reclamation projects with landowners and conservation organizations.

28. Please look back over question 27 and circle the action that you favor the most (if any).

* * * * * * *

* * * * * QUALITY OF RECREATIONAL EXPERIENCE * * * * *

User Conflicts

29. There are some conflicts between boat and shore anglers at times on the Missouri River and outfitter use appears to be increasing. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

_____ Use brochures, signs, or media messages to promote proper "river etiquette" so boat and shore anglers better understand all anglers needs.

(more alternatives on next page)

____ Limit floating use in heavily used river reaches.

____ Control outfitter use through regulation.

____ No action, allowing users to resolve their own problems.

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Motor Boat Use

30. There currently are no special boating restrictions on the Missouri River between Holter Dam and Great Falls. Other larger rivers such as the Flathead, Clark Fork, and Kootenai do not have limitations on amount and/or type of motorized use. However, motor restrictions are enforced on many of the more popular rivers in southwestern Montana. Issues to consider include discrimination against a user group, erosion of river banks due to wave action, having to use car shuttles to move boats upstream, complicating boating regulations, and restricting river travel by riverbank landowners who own motorboats. Please check which one of the following actions that you favor most.

____ Maintain current management. (no restrictions on motorized use).

____ Allow motorized travel only in a downstream direction with no wake.

____ Eliminate motor use in certain river section(s) year round.

____ Establish motor restrictions in certain river section(s) only during high use season.

____ Restrict motor size to 10 horsepower or less.

____ Eliminate all motorized use.

If you favor motorized restrictions, please indicate on what section of river they should be established:_____

_____

= = = = = = = =

Access

31. There is substantial public access on the river between Holter Dam and Cascade. Three new state access sites recently acquired near Ulm and Great Falls should improve access on the lower river. Acquiring river access sites in the future could disperse recreational use, shorten float times, and more effectively utilize the fishery resource. However, purchasing new sites

creates new development, maintenance, and acquisition costs, may reduce the level of solitude in remote river sections, and could lead to overharvest of fish populations. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ **Acquire no new access sites.**

____ **Acquire new access sites where needed.** (Please check where you feel new access is needed)

____ Dearborn River to Hardy bridge (near Mountain Palace)

____ Hardy bridge to Pelican Point access

____ Pelican Point to Cascade

____ Cascade to Ulm

____ UlmtoGreat Falls

32. Do you think development and maintenance at existing access sites is adequate?

____ Yes ____ No

Any specific comments and/or suggestions? _____

_____

33. If new access sites are acquired, what facilities would you like to see? (Please rank from 1 to 7 the need for these facilities with 1=most needed)

____ Boat ramps

____ Camping facilities

____ Drinking water

____ Picnic tables

____ Outhouses

____ Handicap facilities

____ Parking areas

____ Other: _____

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Enforcement

34. Increasing enforcement patrols or implementing a river ranger program on the Missouri could help encourage the wise use of the fishery and recreational resource and could help the Department monitor user satisfaction. However, these measures are costly, may require diverting a warden's time from another area, and may not be necessary at this time. Please indicate your feelings about the following possible actions using a scale of 1 to 5 (1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose).

____ Maintain current enforcement level.

____ Request more time from existing warden(s) during peak fishing season.

____ Assign additional enforcement personnel during peak fishing season.

____ Establish a river ranger position on the river.

35. Please look back over question 34 and circle the action that you favor the most (if any).

* * * * * *

36. Do you want to receive a copy of the final plan?

Yes ___ No ___

Name _____ (Optional)

Address _____

City,State,Zip _____

37. Any other comments on the management of the Missouri River?

_____

_____

_____

THANK YOU!!

Please fold in thirds with address on reverse side showing, staple and mail.

APPENDIX C

A SUMMARY OF THE RESULTS FROM THE MISSOURI RIVER MANAGEMENT PLAN ALTERNATIVES QUESTIONNAIRE

MISSOURI RIVER

USER SURVEY RESULTS

User group	Number sent	Number returned	Percent return
Creeled anglers	512	181	35%
Meeting attenders	176	75	43%
T.U. & Fly Fishers	187	91	49%
Walleyes Unlimited	308	101	33%
Requests	77	41	53%
Total	1260	489	38%

A total of 38% of the mailed questionnaires were completed and returned by the August 16, 1989 deadline. Out of the total, 19% were from the Helena Chapter of Trout Unlimited and the Great Falls Fly Fishers, 37% from anglers interviewed during the 1987 creel census on the Missouri, 15% from participants during the planning meetings held in November, 21% from the Great Falls Walleyes Unlimited, and 8% from requests.

Questionnaire response will be presented by interest group:

W.U.=	Walleye Unlimited, Great Falls Chapter;
T.U.=	Trout Unlimited, Helena Chapter and Great Falls Fly Fishers; and
Gen. Users=	Anglers contacted during 1987 Missouri River creel census, people who attended public scoping meetings, and public who requested alternatives and questionnaires.

*** * * * * GENERAL QUESTIONS * * * * ***

1. How many days per year do you fish or recreate on the Missouri River?

Percent of questionnaires

Days Fished	W.U.	T.U.	Gen. Users	Total
None	0	0	<1	< 1
< 3	11	5	4	6
3 - 7	17	8	12	12
7 - 10	17	13	13	14
> 10	54	74	70	68

Nearly 70% of the total respondents fished the Missouri more than 10 days in a year. Walleyes Unlimited had the lowest percentage of respondents fishing over 10 days per year.

2. What section(s) of the river do you use most frequently? (pick more than one if necessary)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Hlter Dam-Wolf Cr	53	42	48	50
Wolf Cr- Craig	30	68	56	53
Craig-Dearborn	35	54	47	45
Dearborn-Mtn Pal	25	44	42	41
Mtn Pal-Pel Pt	17	14	19	19
Pel Pt-Cascade	7	11	11	11
Cascade to Ulm	9	0	6	6
Ulm to GF	11	0	3	4
Entire river	9	12	12	11

The majority of the respondents fished the upper river from Holter Dam to Mountain Palace.

---

3. What angling method(s) do you use when you fish? (Check all that apply)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Flies	12	83	42	43
Bait	5	0	5	4
Lures	2	2	3	3
Flies,lures,bait	23	5	21	18
Combo bait/lure	47	0	13	18
Flies and lures	4	8	8	7
Bait and flies	6	1	8	6

Fly fishing was the most popular angling method used by questionnaire respondents from all groups except the Walleyes Unlimited. A combination of bait and lures was the most popular method for the Walleye Unlimited respondents. Anglers who use bait as their only method made up 3% of the total respondents.

---

4. If you fish on the Missouri, how often do you fish:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
From Shore				
Almost always	48	34	41	43
Most of the time	13	20	20	18
Some of the time	28	33	25	27
Almost never	1	2	3	2
Never	10	11	11	10

From a Boat				
Almost always	13	18	15	14
Most of the time	11	15	13	13
Some of the time	26	40	33	33
Almost never	13	11	8	9
Never	37	16	30	31
With a Guide				
Almost always	0	1	3	2
Most of the time	0	0	<1	1
Some of the time	1	2	2	2
Almost never	0	11	3	4
Never	99	85	92	90

5. What species of fish do you most often seek to catch in the Missouri River?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Rainbow	12	15	17	14
Brown trout	0	3	2	2
Walleye	11	1	<1	3
Rainbow and Brown	24	70	56	50
Trout and walleye	32	1	12	16
Trout and whitefish	6	7	6	8
Trout and ling	2	0	2	1
Whtfis/ling or wall	3	1	<1	1
No Preference	9	1	5	6

Trout were the most sought after species by all groups except Walleyes Unlimited who fished for both walleye and trout. Other species mentioned on the questionnaire included perch and pike.

6. Based on your experience, which of the following are major problems on the Missouri River? (Please check no more than 4)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Regulations too strict	10	1	5	6
Regulations too liberal	7	52	28	30
Not enough rainbows	5	3	8	7
Not enough browns	7	22	19	18
Too many anglers	11	22	12	14
Too few fish	18	8	12	13
Fish caught too small	11	12	12	13
Too many floaters	17	12	18	20
Poor fishing diversity	10	0	3	4
Enforcement inadequate	13	24	22	22
Flows too high	7	1	2	4
Flows too low	11	5	15	13
Fishing access inadequat	26	11	15	20
Too many homes on banks	15	29	20	22
River banks in bad shape	3	10	8	6
Too many outfitters	26	18	25	26
Too many motor boats	12	42	30	31

Questionnaire respondents felt the major problems were that there were too many motor boats on the river, the regulations were too liberal, too many homes along the banks, and there were too many outfitters. Walleye Unlimited members felt the top four problems on the river were fishing access was inadequate, too many outfitters, too few fish, and too many floaters.

*** * * FISH POPULATIONS-HOLTER DAM to CASCADE * * ***

*** * * * RAINBOW TROUT * * * ***

ANGLER HARVEST

Proposed Management Alternatives
(Question 7)

1. Maintain current rainbow fishing regulations.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	75	40	61	60
Oppose	13	21	20	19
Neutral	12	38	19	21

2. Establish a slot limit allowing 2 fish under 14 inches and 1 over 19 inches in an experimental section.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	36	68	42	48
Oppose	39	16	31	29
Neutral	25	16	27	23

3. Establish an experimental catch and release section.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	50	92	60	65
Oppose	24	2	23	18
Neutral	26	6	17	17

Action You Prefer Most
(Question 8)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Current Regulation	41	14	34	32
Slot Limit	5	9	8	7
Catch and Release	16	66	37	38
No Preference	38	11	22	23

Responses on proposed rainbow regulations varied considerably depending on membership affiliation. The general users were split between maintaining the current regulation and initiating a catch and release section. Of those that responded, Walleyes Unlimited strongly favored maintaining the current regulation while the majority of Trout Unlimited members favored a catch and release section.

PROTECTING RAINBOW SPAWNERS
(Question 9)

Proposed Management Alternatives

1. Close Dearborn River to fishing from November 30 to 3rd Saturday in May.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	65	72	69	69
Oppose	14	8	10	10
Neutral	21	20	22	21

2. Catch and release on the Dearborn River December through 3rd Saturday in May.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	39	64	46	48
Oppose	29	12	22	21
Neutral	33	24	32	31

3. Close Missouri River at mouths of spawning tributaries.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	41	56	45	47
Oppose	34	26	34	32
Neutral	24	18	21	21

4. Open Missouri River only during general fishing season (3rd Saturday in May through November) instead of year round.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	15	14	18	16
Oppose	74	73	71	72
Neutral	11	13	11	11

5. Eliminate use of fish eggs for bait.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	25	82	56	55
Oppose	53	7	24	26
Neutral	22	11	20	19

Action You Prefer Most
(Question 10)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Close Dearborn	26	21	18	20
Catch and Rel Dearborn	7	11	13	11
Close Mo.at tribs	12	12	13	12
Gen Fish Seas. on Mo	7	8	7	7
No eggs for bait	4	26	21	18
No Preference	45	22	28	31

Closing the Dearborn River from November 30 to the 3rd Saturday in May received the greatest support from W.U. followed by closing the Missouri River at spawning tributaries. T.U. and the general users favored banning the used of eggs for bait and closing the Dearborn. Initiating a general fishing season on the Missouri was the least favored alternative.

IMPROVING SPAWNING SUCCESS
(Question 11)

Proposed Management Alternatives

1. Remove beaver dams and/or modify irrigation diversion structures that create major barriers to spawning movements.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	79	85	78	80
Oppose	13	3	9	9
Neutral	7	11	13	11

2. Enhance minimum flows in spawning tributaries by leasing available water rights.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	85	92	80	83
Oppose	2	0	7	5
Neutral	12	8	14	12

3. Determine fish losses caused by irrigation practices and screen canals and/or pump inlets if losses are significant.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	76	88	84	84
Oppose	1	1	3	2
Neutral	23	10	13	14

4. Investigate spawning habitat in other tributaries.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	72	73	69	70
Oppose	2	2	4	26
Neutral	25	25	27	3

Action You Prefer Most
(Question 12)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Remove beaver dams	15	26	24	23
Enhance minim.flows	23	41	29	30
Determine eff of irrig	10	9	11	10
New spawning habitat	6	5	3	4
No Preference	47	19	32	32

All alternatives but investigating spawning habitat were strongly supported by the questionnaire respondents with little variation between user groups. The action favored most was enhancing minimum stream flows.

*** * * * BROWN TROUT * * * ***

ANGLER HARVEST
(Question 13)

Proposed Management Alternatives

1. Maintain current fishing regulations.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	40	19	35	33
Oppose	25	58	43	42
Neutral	36	23	21	25

2. Continue current regulations and use educational techniques designed to reduce brown trout harvest.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	50	38	40	42
Oppose	19	37	34	32
Neutral	31	25	26	27

3. Change current 5 fish limit to include only 1 brown trout.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	36	43	39	39
Oppose	32	24	31	29
Neutral	31	33	31	31

4. Slot limit to allow harvest of 1 brown trout under 11 inches and 1 over 18 (or 20 or 22 or 24) inches.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	49	61	61	59
Oppose	28	22	22	23
Neutral	24	17	17	18

Slot Size Desired:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
18 inches	24	28	28	28
20 inches	18	25	28	26
22 inches	30	15	17	18
24 inches	27	32	27	28

Allow harvest of one brown trout which must exceed:

5. 18 inches:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	56	59	50	53
Oppose	28	23	33	31
Neutral	17	18	16	17

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6. 20 inches:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	44	70	46	49
Oppose	27	18	32	29
Neutral	29	11	22	22

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7. 22 inches:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	24	59	36	38
Oppose	37	23	40	37
Neutral	39	18	23	25

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8. 24 inches:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	32	75	40	45
Oppose	36	16	41	35
Neutral	32	10	19	19

9. Catch and release all brown trout.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	14	65	31	35
Oppose	67	25	55	51
Neutral	19	10	14	14

Action You Prefer Most
(Question 14)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Current Regulation	11	5	9	9
Curr regul w/ Educa	10	3	7	7
1 Brown Trout	2	3	2	2
Slot Limit	15	17	21	19
1 brown >18"	6	5	9	7
1 brown >20"	3	12	7	7
1 brown >22"	2	4	4	4
1 brown >24"	5	6	4	5
Catch and release	5	30	15	15
No Preference	41	14	23	26

The proposed slot limit was the most favored alternative from all user groups except Trout Unlimited. Walleyes Unlimited were the only user group which also favored maintaining current regulations. General users also favored a catch and release section. When totaled, 22% of the total respondents favored a regulation with 1 brown trout over a minimum size regulation and 44% preferred a slot or the 1 over a minimum regulation.

15. If you favor a special regulation for brown trout, where do you want it?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
On entire river?	48	72	65	62
In experim. section?	20	20	25	23
No preference	32	8	11	15

20. Allow bait fishing in any "special regulation" section.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	69	20	62	45
Oppose	18	66	22	41
Neutral	13	13	16	13

BROWN TROUT SPAWNER PROTECTION
(Question 16)

Proposed Management Alternatives

1. Close Little Prickly Pear Creek to fishing from September 1 to the third Saturday in May.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	75	71	75	73
Oppose	18	21	14	16
Neutral	8	8	11	11

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2. Close Missouri River at mouth of Little Prickly Pear Creek from September 1 through November 15.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	58	55	55	55
Oppose	24	24	25	20
Neutral	18	20	21	24

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3. Catch and release in Missouri River at mouth of Little Prickly Pear Creek from September 1 through November 15.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	39	72	48	51
Oppose	46	19	34	33
Neutral	14	9	18	16

4. Catch and release of brown trout in entire Missouri River between September 1 and November 15.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	37	71	49	52
Oppose	37	12	31	28
Neutral	26	17	20	20

5. Eliminate use of fish eggs for bait.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	32	87	62	62
Oppose	51	9	22	24
Neutral	17	4	16	14

Action You Prefer Most
(Question 17)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Close Lit Pric Pear	28	20	23	23
Close Missouri at LLP	6	5	7	6
Ctch&rel at Mo at LLP	5	5	10	8
Ctch&rel entire Mo	12	32	14	17
No eggs for bait	8	20	19	17
No Preference	42	18	27	29

Closing Little Prickly Pear Creek was the action most preferred by the total respondents followed by catch and release in the river at Little Prickly Pear mouth in the fall and eliminate the use of fish eggs for bait. Walleyes Unlimited favored the use of eggs for bait alternative least.

IMPROVING SPAWNING SUCCESS
(Question 18)

Proposed Management Alternatives

1. Remove beaver dams and/or modify irrigation diversion structures that create major barriers to spawning movements.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	72	84	77	78
Oppose	12	5	9	9
Neutral	17	11	13	13

2. Enhance minimum flows in spawning tributaries by leasing available water rights.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	82	93	80	83
Oppose	5	0	8	5
Neutral	13	7	12	11

3. Determine fish losses caused by irrigation practices and screen canals and/or pump inlets if losses are significant.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	89	88	82	85
Oppose	1	1	3	2
Neutral	10	10	15	13

4. Investigate spawning habitat in other tributaries.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	69	76	73	73
Oppose	4	1	3	3
Neutral	27	23	24	24

Action You Prefer Most
(Question 19)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Remove beaver dams	11	21	23	20
Enhance minim.flows	22	45	25	28
Determine irrig effect	15	11	13	13
New spawning habitat	4	2	4	4
No Preference	49	21	34	35

All alternatives were strongly supported by the questionnaire respondents. The action favored most was enhancing minimum stream flows although removing beaver dams and modifying irrigation structures was preferred by 20% of the total respondents.

*** * * * * FISH POPULATIONS-CASCADE to GREAT FALLS * * * ***
(Question 21)

Proposed Management Alternatives

1. Maintain current management.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	69	72	68	68
Oppose	10	3	5	5
Neutral	21	26	29	26

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2. Inventory fish populations and physical habitat to determine suitability for warm/cool species.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	83	48	59	62
Oppose	2	28	14	14
Neutral	15	24	26	24

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3. Evaluate potential for enhancing warm/cool water species including smallmouth bass and walleye.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	84	36	54	57
Oppose	8	40	27	26
Neutral	7	23	20	18

4. Enhance trout spawning opportunities in Sheep Creek and investigate potential for creating or enhancing other trout spawning areas.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	78	91	83	84
Oppose	5	0	1	1
Neutral	17	9	16	15

5. Attempt to enhance trout populations with hatchery rainbow plants in selected areas.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	58	30	44	44
Oppose	18	48	31	32
Neutral	24	22	24	24

Action You Prefer Most
(Question 22)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Maintain current manage.	3	10	9	8
Inventory popul.and hab	3	7	7	6
Enhnc warm water species	45	12	18	22
Enhance trout populs	7	40	25	24
Enhance trout w/plants	1	3	9	6
No Preference	42	29	33	34

Enhancing trout spawning opportunities and enhancing warm/cool water species were preferred most by total respondents. Walleye Unlimited and Trout Unlimited voted along party lines, with warm water preferred and trout preferred, respectively.

*** * * * * * * FISH HABITAT * * * * * * ***

Corridor Protection/Land Use

23. Do you feel that degradation of the riparian zone is a major problem on the Missouri?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Yes	49	76	58	59
No	51	24	42	41

24. Do you feel that the current land development regulations are adequately protecting the Missouri River corridor?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Yes	42	15	35	33
No	58	85	65	67

25. Would you support more stringent development standards for the river corridor if the counties and/or conservation districts considered adopting such standards?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Yes	83	96	84	86
No	17	4	16	14

26. Do you own land along the Missouri River?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Yes	12	8	10	11
No	88	92	90	89

There was concern among some users groups that the Missouri River corridor is in a degraded state and that current laws and regulations are not stringent enough. All user groups favored more stringent land developments standards. Although the majority of respondents who owned land along the river felt the corridor wasn't in a degraded state, they would support more stringent development standards.

(Question 27)

1. Investigate opportunity to use River Restoration Fund for conservation easements.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	86	97	85	88
Oppose	2	0	2	1
Neutral	12	4	13	11

2. Promote and provide public education on protection of streamside habitat zones to river bank landowners, sporting clubs and conservation districts.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	83	92	86	86
Oppose	1	0	1	1
Neutral	16	8	13	13

3. Develop cooperative riverbank reclamation projects with landowners and conservation organizations.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	91	94	87	89
Oppose	2	1	1	1
Neutral	7	5	12	10

Action You Preferred Most
(Question 28)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Use Restoration Fund	22	41	27	28
Corridor Education	19	10	20	18
Corr Reclamation Projs	21	29	18	20
No Preference	39	21	35	33

*** * * * * QUALITY OF RECREATIONAL EXPERIENCE * * * * ***

User Conflicts

Proposed Management Alternatives

1. Use brochures, signs, or media messages to promote proper "river etiquette".

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	83	90	87	66
Oppose	2	0	3	2
Neutral	15	10	10	11

2. Limit floating use in heavily used river reaches.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	43	35	41	40
Oppose	35	36	35	35
Neutral	22	28	24	24

3. Control outfitter use through regulation.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	78	55	68	67
Oppose	14	23	15	16
Neutral	8	22	17	16

4. No action, allowing users to resolve their own problems.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	16	19	16	17
Oppose	66	63	61	63
Neutral	17	18	22	20

Motor Boat Use
(Question 30)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Maintain curr mgmt	54	10	37	35
Travel downstream only	2	3	3	3
No motors by section	4	26	10	11
No motors by season	6	6	9	8
10 hp or less	23	28	23	24
No motors ever	10	27	18	18

Maintaining current motor use was the most strongly favored alternative by all user groups except Trout Unlimited. A horsepower restriction or no motors ever by section or on the entire river were most favored by T.U.

Access
(Question 31)

Acquire no new access sites:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	27	51	39	39
Oppose	62	39	42	45
Neutral	11	10	19	16

Acquire new access sites where needed:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	79	69	68	70
Oppose	15	17	20	18
Neutral	6	13	12	11

Sections needing access:

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Dearborn R to Hardy br	23	51	24	28
Hardy br to Pelican Pt	15	32	25	24
Pelican Pt to Cascade	23	24	30	30
Cascade to Ulm	57	27	47	48
Ulm to Great Falls	66	22	42	46

32. Do you think development and maintenance at existing access sites is adequate?

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Yes	89	77	83	84
No	11	23	17	16

33. If new access sites are acquired, what facilities would you like to see? (Ranked from 1 to 7 with 1=most needed)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Boat Ramps	1	3	3	3
Camping	4	6	7	7
Water	5	4	4	4
Picnic facilities	7	5	5	6
Outhouses	2	1	1	1
Handicap	6	7	6	5
Parking	3	2	2	2

The rankings above were determined by totalling the top 3 most needed facilities. Outhouses, boat ramps, and parking were the most needed for all user groups.

Enforcement
(Question 34)

1. Maintain current enforcement level

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	66	38	55	53
Oppose	12	30	22	22
Neutral	22	32	25	26

2. Request more time from existing warden(s) during peak fishing season.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	40	62	52	51
Oppose	29	8	14	16
Neutral	32	30	34	33

3. Assign additional enforcement personnel during peak fishing season.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	55	76	61	63
Oppose	16	7	13	12
Neutral	29	17	27	25

4. Establish a river ranger position on the river.

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Support	45	73	53	56
Oppose	33	12	22	22
Neutral	22	15	25	22

Action You Prefer Most
(Question 35)

	Percent of questionnaires			
	W.U.	T.U.	Gen. Users	Total
Maintain curr enforcem	19	13	22	19
More from existing staff	6	7	8	7
Add person at heavy use	17	15	15	15
River ranger	18	47	25	28
No Preference	41	18	30	30

All the alternatives received support except for requesting more time from existing wardens during the peak fishing season. The action most preferred by all user groups except Walleyes Unlimited was establishing a river ranger position.